

2. CHAPTER TWO - ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

This chapter is the heart of the environmental impact statement, (40 CRF 1502.14). It contains detailed descriptions of the proposed action and alternatives to the proposed action including mitigating measures, management requirements, best management practices, and monitoring requirements, and a comparison of alternatives (Table 6 & 7) at the end of the chapter. This comparison table defines how each alternative relates to the evaluation criteria and needs discussed in Chapter One. Five alternatives for the Lemolo Watershed Project were considered in detail. This chapter also describes the process used to formulate alternatives and any alternatives eliminated from detailed study.

2.2 FORMULATION OF ALTERNATIVES

The Interdisciplinary Team (IDT) used the Purpose and Need along with the significant issues as the basis for alternative development. This resulted in a range of alternatives that meets the Purpose and Need and responds to significant issues. A no action alternative was developed as a baseline for estimating environmental effects. It was also developed to address members of the public who feel that any timber harvest on Federal land is still an unresolved conflict concerning alternative uses of the available resources.

2.2.1 ALTERNATIVES ELIMINATED FROM DETAILED STUDY

No alternatives were eliminated from detailed study. The original Alternative Three in the first DEIS for Lemolo Watershed Projects DEIS was dropped from detailed study. Alternative Three was revised after the first DEIS went out for public comment. These changes more accurately reflected the public's concern regarding recreational values in the Lemolo Watershed Projects Analysis area.

2.2.2 ALTERNATIVES CONSIDERED

The IDT considered five alternatives including the proposed action. The description of the action alternatives follows the format below.

- A narrative describing what the alternative addresses in relation to the significant issues.
- A map displaying proposed activity areas.
- An alternative summary table displaying specific harvest unit information.
- A narrative describing the proposed activities including best management practices, mitigating measures, and management requirements.

A monitoring plan in table form (Table 5) at the end of this section outlines monitoring requirements for all action alternatives.

2.3 ALTERNATIVE 1 (NO ACTION)

This alternative serves as a benchmark, enabling the responsible official and IDT to compare the magnitude of effects of the action alternatives. It also addresses members of the public who feel that no timber harvest should take place on Federal land, no old growth should be harvested, and the recreational value around the Lemolo Lake Recreation Area should be preserved. No action will occur within the Lemolo Watershed Projects Analysis area. This alternative will not meet the need for action described in Chapter One. Although no actions would be implemented with this alternative, it is important to note that other activities will still take place. These activities would include recreation management, routine road maintenance, and project activities covered under other decision documents.

2.3.1 ACTIVITIES UNDER ALTERNATIVE 1 (NO ACTION)

TIMBER HARVEST AND ROAD WORK

No timber harvest, reforestation, slash treatment, or road construction, reconstruction, and decommissioning will occur under this alternative. There will be no probable sale quantity (PSQ) of timber for local and regional economies. There will be no early successional habitat created within the Lemolo watershed. There will be no improvement to hydrologic function related to the Forest Service road system.

FUEL TREATMENT/FIRE HAZARD REDUCTION

No fire hazard reduction will occur through harvest activities and natural fuel treatments. The Lemolo watershed will not begin to move from a high severity fire regime towards the historical moderate severity fire regime.

PINE HEALTH AND STAND DENSITY MANAGEMENT

Pine health will continue to decline within the Lemolo watershed. These declines would lead to increased mortality in mature and old growth pine, increasing the likely hood of a mountain pine beetle outbreak within mature Lodge pole pine stands, and increasing susceptibility of trees to insects and disease within stands not undergoing silvicultural treatment. Overstocked stands targeted for density management would continue to decline in vigor.

SITE PRODUCTIVITY

Site productivity will not be improved on 264 acres of plantations within the Lemolo watershed through sub-soiling of old compacted temporary roads, landings, and skid trails. Losses to surface organic matter and poor water infiltration rates will continue on these sites.

RECREATIONAL VALUE AND OLD GROWTH

Recreational value will not be reduced for some concerned publics, because there will be no timber harvest around the Lemolo Lake Recreation Area. Old growth habitat will not be harvested and converted to early successional habitat. Thirty one percent of the Lemolo watershed will remain as old growth habitat.

2.4 ALTERNATIVE 2

The IDT used the Purpose and Need solely as the basis for development of this alternative. The Proposed Action meets the direction found in the 1990 Umpqua National Forest Land and Resource Management Plan (LRMP) as amended, and follows the recommendations in the Diamond Lake and Lemolo Lake Watershed Analysis. The interdisciplinary team worked together in the field for one year to develop the Proposed Action. It must be noted, most of the members of the IDT were participants in the Diamond Lake / Lemolo Lake Watershed Analysis for this area. In doing so, the IDT had a clear idea of the recommendations that were made and how best to incorporate them into development of the proposed action. This alternative best meets the Purpose and Need because it:

- Provides the most probable sale quantity to local economies.
- Provides for the most early successional habitat within matrix lands within the Lemolo watershed.
- Reduces fuel levels over the most acres within the Lemolo watershed.
- Promotes pine health over the most acres within the Lemolo watershed.
- Improves stand health and vigor through density management over the most acres within the Lemolo watershed.
- Provides the most Knutson-Vandenberg (KV) funds for restoration activities, including site productivity improvement and road decommissioning.

2.4.1 ACTIVITIES UNDER ALTERNATIVE 2

TIMBER HARVEST AND ROAD WORK

Timber sales will harvest 448 acres using shelterwood and seed tree silvicultural prescriptions (Picture 1 & Picture 2), commercially thin 892 acres (Picture 4, Picture 5), partial harvest 39 acres through individual tree selection, harvest 146 acres through small group selection (Picture 3), selectively harvest 42 acres for posts and poles, and harvest 10 acres for house logs using seed tree silvicultural prescriptions. Timber harvest would produce approximately 27.7 million board feet. All timber harvest activities would meet current standards and guidelines for matrix lands. Artificial reforestation and/or natural regeneration will be used to establish new stands. More detail on silvicultural prescriptions can be found in the Silvicultural Prescription in Appendix I. Five sales are planned to be sold in 2004 and 2005 and operate for 2-3 years. Logging systems will be a combination of skyline, helicopter, loader, and mechanical. Construction of two permanent helicopter landings will occur. These sales will supply timber to local and regional economies on a cost efficient, sustainable basis and help meet the Probable Sale quantity for the Umpqua National forest in 2004 and 2005. No timber harvest will occur within inventoried road-less areas, riparian reserves, unsuitable soils, the OCRA, cultural sites or owl cores.



Picture 1 – Shelterwood Prescription With Green-tree Retention Leave Group



Picture 2 – Seed tree Prescription with Green-tree Retention Leave group in Background



Picture 3 – Small Group harvest – 1 to 5 Acres in Size

Approximately 3.17 miles of new system road construction, 51.79 miles of road reconstruction/maintenance, 6.19 miles of road decommissioning inside potential sale area boundaries, 4.83 miles of road decommissioning outside potential sale area boundaries, 3.9 miles of temporary road construction and subsequent obliteration, and 2 acres of helicopter landing construction will occur under this alternative.

FUEL TREATMENT/FIRE HAZARD REDUCTION

Natural fuels and harvest activity fuels will be treated on 1,861 acres (282 acres of natural fuels) within the Lemolo watershed through underburning and pile burning. Fuel levels will be reduced to less than 21 tons/acre over the 1,861 acres (Picture 5 & **Error! Reference source not found.**). This will begin to move the Lemolo watershed from a high severity fire regime towards the historical moderate severity fire regime.



Picture 4 – Stand before a commercial thin from below



Picture 5 – Stand after thinning and controlled underburn

PINE HEALTH AND STAND DENSITY MANAGEMENT

Pine health will be promoted on 1,703 acres within the Lemolo watershed through silvicultural prescriptions that reduce stand densities around individual pine trees; regenerate harvested areas with blister rust resistant white pine and sugar pine, and ponderosa pine; and harvest greater than 80 year old lodge pole pine stands that are highly susceptible to a mountain pine beetle outbreak. Stand health and vigor will be improved on 892 acres of mixed conifer stands within the Lemolo watershed through commercial thinning prescriptions that reduce existing stand densities (Picture 6).



Picture 6 – Commercial thin leaving old growth remnants

SITE PRODUCTIVITY

Site productivity will be improved on 264 acres of plantations within the Lemolo watershed through subsoiling of old temporary roads, landings, and skid trails. KV funding will finance 192.4 acres of the 264 acres planned.

RECREATIONAL VALUE AND OLD GROWTH

Recreational value will be reduced for some concerned publics, through timber harvest on 941 acres surrounding the Lemolo Lake Recreation Area. Three hundred acres of old growth habitat will be harvested and converted to early successional habitat.

Figure 1 – Alternative Two Map

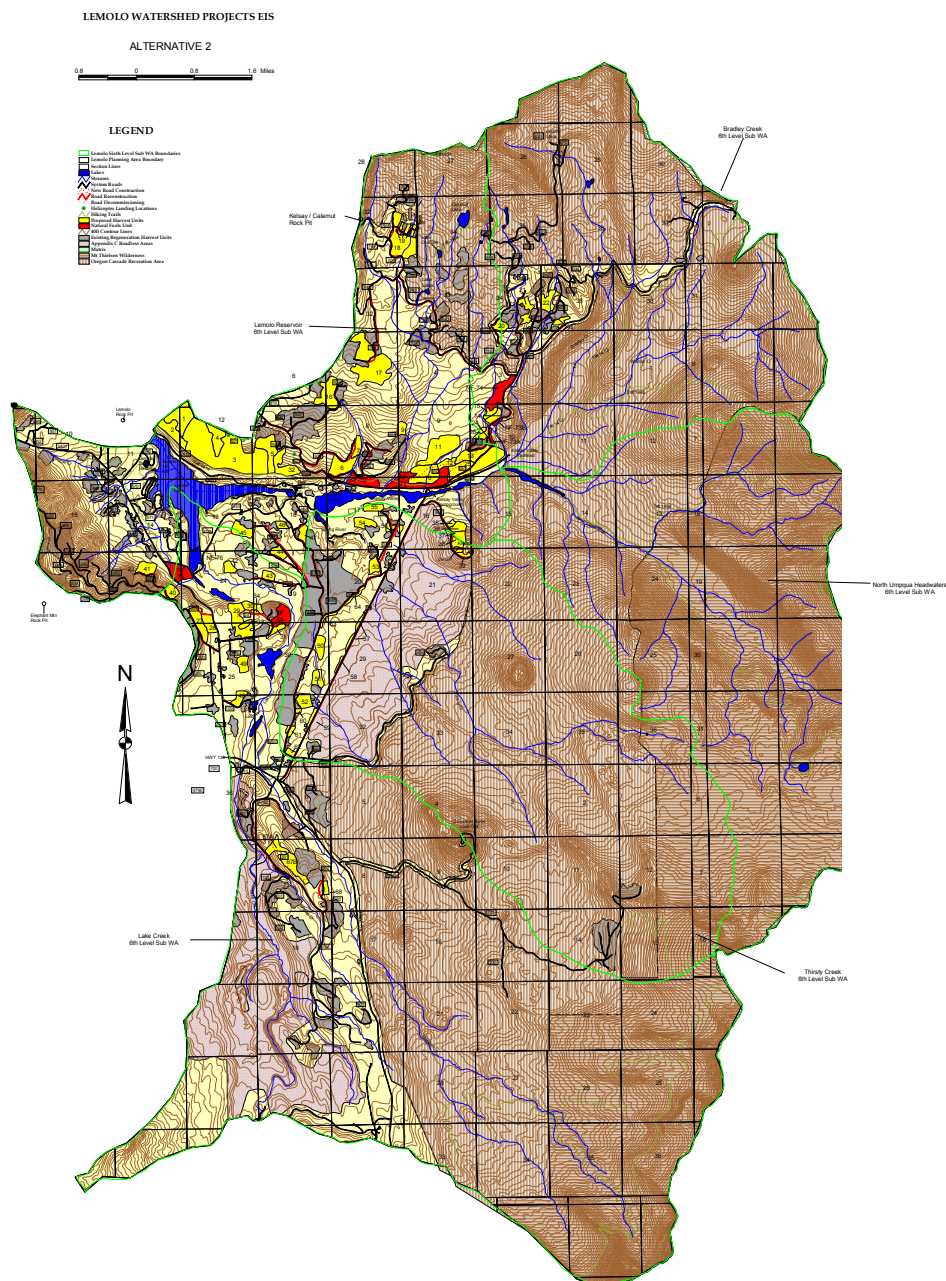


Table 1 – Alternative Two Unit Summary (Proposed Action)

Unit Number	Silviculture RX	Gross Acres	Net Acres	Cut Volume (mbf/ac)	Unit Volume (mbf)	Logging Method	Fuels Treatment
1	HTH	62	62	25	1550	HEL	HP/YT
2	HGR	41	5	50	250	HEL	HP
3	HTH/HGR	297	297	15	4455	HEL	HP
4	HTH	40	40	20	800	HEL	HP
5	HPR/HGR	51	43	15	650	HEL	HP/WF
6	HTH/HGR	49	49	20	980	SKY/LL	UB
7	HSH/HTH	18	16	40	641	SKY	UB/WF/SP
9	HSH	13	12	40	463	SKY	UB/WF
10	HTH/HGR	58	58	20	1160	SKY/LL	UB
11	HTH/HGR	82	82	15	1230	LL	HP/GP
12	HSH	16	14	40	544	LL	GP/WF
13	HTH/HGR	36	36	20	720	SKY/LL	HP
14	HSH/HTH	15	13	20	255	SKY	UB/WF/SP
15	HTH/HGR	10	10	15	150	MEC	HP
16	HGR	57	11	25	285	LL	GP
17	HGR	146	29	20	584	LL	GP
18	HGR	88	18	20	352	LL	GP
19	HCR	14	12	20	238	LL	GP
20	HGR	16	3	20	64	LL	GP
21	HGR	24	5	20	96	LL	GP
22	HGR	32	6	20	128	LL	GP
23	HGR	9	2	20	36	LL	GP
24	HSH	9	8	20	153	SKY	UB/WF
25	HTH/HGR	93	93	10	930	SKY/LL	HP
26	HTH/HGR	7	7	15	105	MEC	HP/YUM(LPP)
27	HSH	37	31	35	1101	LL	GP/WF
28	HTH	21	21	10	210	MEC	HP/YUM(LPP)
29	HTH/HGR	57	57	15	855	SKY/MEC	HP
30	HSH	18	15	55	842	SKY	UB
31	HTH	14	14	15	210	MEC	HP
32	HTH/HGR	41	41	15	615	HEL	HP
33	HSH	8	7	25	178	LL	UB
34	HTH	3	3	20	60	SKY	UB
35	HTH	5	5	10	50	MEC	HP
36	HSH	16	16	35	560	LL	UB/SP
37	HSH	14	14	35	490	SKY	UB/SP
38	HTH	12	12	20	240	SKY	UB
39	HTH	6	6	25	150	SKY	UB
40	HSH	22	19	45	842	SKY	UB
41	HSH	26	22	45	995	SKY	UB
42	HCR	14	12	7	83	MEC	UB
43	HCR	13	11	7	77	MEC	UB
44	HCR	18	15	7	107	MEC	UB
45	HCR	29	25	7	173	MEC	UB
46	HCR	9	8	7	54	MEC	UB

Unit Number	Silviculture RX	Gross Acres	Net Acres	Cut Volume (mbf/ac)	Unit Volume (mbf)	Logging Method	Fuels Treatment
47	HCR	15	13	7	89	MEC	UB
48	HCR	27	23	7	161	MEC	UB
49	HCR	19	16	7	113	MEC	UB
50	HCR	25	21	7	149	MEC	UB
51	HCR	20	17	7	119	MEC	UB
52	HCR	23	20	7	137	MEC	UB
53	HCR	18	15	7	107	MEC	UB
54	HCR	22	19	7	131	MEC	UB
55	HCR	17	14	7	101	MEC	UB
56	HCR	13	11	7	77	MEC	UB
57	HPR*	11	10	1	10	MEC	HP
58	HPR*	4	4	1	4	MEC	HP
59	HPR*	9	8	1	8	MEC	HP
60	HCR*	3	2	5	10	MEC	HP/GP/UB
61	HCR*	9	8	5	38	MEC	HP/GP/UB
62	HPR*	7	6	1	6	MEC	HP
63	HPR*	7	6	1	6	MEC	HP
64	HPR*	9	8	1	8	MEC	HP
67-A	HTH/HGR	39	39	20	780	SKY/LL	HP
67-B	HTH/HGR	23	23	20	460	SKY/LL	HP
68	HSH/HTH	10	9	50	450	SKY	UB/SP/WF
HL-77	HCC	1	1	30	30	LL	GP
HL-78	HCC	1	1	30	30	LL	GP
Total			1579		27735		

HPR* - Post & Pole harvest
HSH – Shelterwood (8-12 tpa)
HCR – Seedtree (4-6 tpa)
HTH –Thinning
HCR* - House log harvest
HGR – Small group harvest
HPR – Partial harvest
HCC – Helicopter landing

UB – Underburning
SP – Slash pull back
HP – Handpile
GP- Grapple pile
YT – Yard tops
WF – Whip fall
YUM – Yard unutilized material

HEL – Helicopter
MEC – Mechanical Logging
LL – Loader Logging
SKY – Skyline Logging

New System Road Construction 3.17 miles
System Road Reconstruction / Maintenance 51.79 miles
System Road Decommissioning 11.02 miles

Note – The 15% leave Tree Retention Group for unit 36 and 37 will be located outside the unit boundary. The area that will be left is 6 acres and is located between unit 38 and 39. This stand better represents the largest and oldest trees for the area.

2.4.2 BEST MANAGEMENT PRACTICES, MANAGEMENT REQUIREMENTS AND MITIGATING MEASURES

The following best management practices, management requirements, and mitigating measures will be implemented in order to meet the Standards and Guidelines in the Umpqua National Forest Land and Resource Management Plan, as amended. In most cases, they have been designed to reduce or eliminate potential environmental effects. General Water Quality Best Management Practices (USDA-FS 1988) are prescribed to protect beneficial uses and meet water quality objectives. A cross reference to the Pacific Northwest Regional Guide is included with each best management practice (BMP). The BMPs are rated by their ability to implement and their effectiveness as defined by the 1988 Pacific Northwest Regional BMP Guide. The interdisciplinary team determined ratings. The possible ratings are as follows:

ABILITY TO IMPLEMENT

- High - Almost certain the BMP can be implemented.
- Moderate - Greater than 75% certainty the BMP can be implemented as planned.
- Low - Less than 75% certainty the BMP can be implemented as planned.

EFFECTIVENESS

- High - BMP is highly effective (>90%) based on one or more of the following types of documentation:
 - a) Literature/Research applicable to area.
 - b) Administrative Studies applicable to area.
 - c) Experience - judgment of an expert by education and/or experience.
 - d) Fact - obvious by reasoned (logical) response.
- Moderate - Documentation shows that the BMP is effective less than 90% of the time but at least 75% of the time or logic indicates that the BMP is highly effective but there is little or no documentation to back it up.
- Low - Effectiveness unknown or unverified and there is little or no documentation or applied logic is uncertain in this case or the BMP is estimated to be less than 75% effective.

LOGGING SYSTEMS AND TIMBER SALE REQUIREMENTS

- BMP (T-5, R-3) – Normal operating season will be from June 1 through October 31. Operations outside the normal operating season are permitted only when they can be conducted without resource damage. Contract provisions: AT17, BT6.31, BT6.65, BT8.21, BT9.3

Ability to Implement: High

Effectiveness: High (c,d)

- BMP (T-17, 21, 22; VM-2) – The following contract provisions will be required: Meadow Protection BT6.61, Sanitation and Servicing BT6.34, Contract Modification BT8.3

Ability to Implement: High

Effectiveness: High (d)

- BMP (T-4) - The following features will be designated on the Sale Area Map: all stream courses to be protected, unit boundaries, specified system roads, restricted haul routes, improvements, yarding methods, rock sources.

Ability to Implement: High

Effectiveness: High (d)

- Cultural resources will be protected if found during logging or road construction. Contract Provision: CT6.24#
- Prior to all operations and prior to unit boundary changes, the sale administrator and engineering representative will confer with the Heritage Program Manager. Any unit boundary changes made by the sale administrator due to logging feasibility will be tracked through GIS.
- The helicopter pads associated with the permanent helicopter landings located on proposed system roads 6000-937 and 6000-921 will be rocked. The rest of the area associated with the landings will be seeded with native grass or brush species to prevent establishment of trees and also serve as erosion control.
- BMP (T-9, 11; VM-1) - A tracked loader machine with at least a 35 foot boom will be used for yarding operations in order to minimize soil displacement and compaction in units 11, 12, 16 - 23, 27, 33, and 36 and portions of units 6, 10, 13, 25, and 67 A & B. Equipment will be restricted to designated loader paths and temporary haul roads approved by the sale administrator. Designated loader paths should be spaced an average of 100 feet apart. Designated temporary haul roads should be located at least 400 feet apart. The tracks on the loader will operate in a straight line, thus reducing soil displacement. Directional felling will be required into designated loader paths. Contract Provision; CT6.42#, CT6.4

Ability to Implement: High

Effectiveness: Moderate (c)

- Protection of genetic trees and other reserve trees will be required. Contract provision: CT2.301#
- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment and reforestation.
- BMP (T-9,11;VM-1) – A mechanized logging system will be used for felling and yarding operations in units 15, 26, 28, 29, 31, 35, 42 through 64. Equipment causing detrimental soil impacts will be restricted to designated paths spaced an average of 100 feet apart. Contract Provision CT6.42#, CT6.4

Ability to Implement: High

Effectiveness: Moderate (c)

- To avoid noxious weed introduction, heavy equipment will be cleaned prior to entering the sale area. Contract Provision: CT6.343 (Option 2)

- BMP (T-12) - One end suspension and 75 foot lateral yarding will be required on skyline yarded units 7, 9, 14, 24, 30, 34, 37 through 41 and 68 and portions of units 6, 10, 13, 25, 29 and 67A & B to limit soil displacement. Contract Provision; CT6.42#

Ability to Implement: High

Effectiveness: High (c)

- To avoid damage to leave trees due to bark slippage, operations will be restricted to July 15 through October 31 in units 1, 3, 4, 6, 7, 10, 11, 13, 14, 15, 25, 26, 28, 29, 31, 32, 34, 35, 38, 39, 67A & B and 68. Contract Provision; CT6.315#

RECREATION

- Units 2, 3, 5 and 32 will require a 200 foot no cut buffer along the North Umpqua Trail.
- No commercial vehicles over 20,000 lbs will be allowed on the 2612 road from the junction of the 2610 to the 2614 roads and the 2614 road starting at the junction with the 2610 to the 2612 roads. This will reduce the conflict with recreation use.
- Recreation and forest users will be notified of all activities associated with logging operations through signing. The signs will be placed throughout the project area.
- Helicopters will be restricted from flying over the North Umpqua trail in Units 1, 2, 3, 4, 5 and 32. Helicopter landings are located in areas where flight paths will avoid the trail.

TRANSPORTATION SYSTEM

- BMP (T-15,16;R-18,23;W-8) - Temporary roads in units 6, 10 through 13, 15, 16 through 23, 25, 27-31, 33, 35, 36, 42 through 56, and 67A & B will be obliterated following logging use. They will be sub-soiled to 20 inches with an excavator to prepare a seedbed and allow for water drainage.

Ability to Implement: Moderate

Effectiveness: Moderate

- Temporary roads constructed in units 15, 26, 28, 29 and 31 will be left open to maintain short-term access to portions of the unit for post-sale treatments but will be obliterated when this work is complete. Contract Provision; CT6.621
- Excavated material will be pulled back and stabilized as close to the ground profile as possible. Slash depths will not exceed 6 inches. Stumps and slash will be placed back over 80% of the road surface for erosion control purposes. Contract Provisions: CT5.1# (Option 1)

Ability to Implement: High

Effectiveness: High (b, c, d)

- Road use restrictions will conform to Umpqua National Forest direction.
- Road specifications and maintenance levels for construction and reconstruction will be prescribed in the road management objectives.

- BMP (R-18;W-8) – Roads 2610-222, 345, 347, 350, 634; 2614-454, 455, 456; 4792-200; 6000-620, 621, 622, 631, 742, 743, 746, 750, 751, 920, 921, 930, 934, 936, 940, 950, 972 and 973 will be closed with rocks, earth berms, or gates following logging use in order to reduce erosion and the need for road maintenance. CT5.43

Ability to Implement: High

Effectiveness: High (d)

- BMP (R-2,4,5,8,9) – Erosion control will be required during construction of temporary roads in units 6, 10, 11, 12, 13, 15, 16, 17, 18, 19 through 23, 25 through 29, 31, 33, 35, 36, 42 through 56 and 67A & B; and system roads 2610-347; 4790-201; 6000- 921, 937, 945, 951, 952, and 960. Erosion control will also be required during the reconstruction / maintenance of system roads 2610-100, 200, 222, 345, 346, 347, 350; 2614-430, 454, 455, 456, 630, 634; 4700-700; 4790; 4792, 4792-000, 200; 6000, 620, 621, 630, 631, 700, 742, 746, 750, 751, 920, 930, 934, 935, 936, 940, 945, 950, 960, 970, 971, 972 and 973. Specific measures include timing of construction, berms, and slope drains and insuring drainage structures are in place before each rainy season. Grass seeding will not be required on roads located above 4500 feet in elevation. Contract Provision: BT6.6, CT6.6#, and Standard and Special Specifications for Construction are required.

Ability to Implement: Moderate

Effectiveness: Moderate

- BMP (R-1) – The location, design, and construction of temporary roads in units 6, 10, 11, 12, 13, 15, 16, 17, 18, 19 through 23, 25 through 29, 31, 33, 35, 36, 42 through 56, and 67A & B; and system roads 2610-347; 4790-201; 6000-921, 937, 945, 951, 952, and 960 will be accomplished with minimal resource damage. Contract Provision: CT5.1# (Option 1)

Ability to Implement: high

Effectiveness: High (c)

- BMP (R-20) – Traffic will be controlled during wet weather to prevent erosion and damage to roads. Contract Provision: CT5.12#
- BMP – KV funds will be collected to decommission system roads 2610-100, 345 & 346; 2614-450, 460, 470; 6000-745, 750, 753, 754 and 932.

SOILS

- BMP (T-6) - Lands identified as technically unsuitable for timber production will be entered in GIS.

Ability to Implement: High

Effectiveness: High (d)

- The combined total areas of detrimentally compacted, displaced, puddled, and severely burned soil within an activity area will not exceed 20 percent. All roads and landings, unless rehabilitated to acceptable conditions, are considered to be in detrimental condition and are included as part of this 20 percent. Post-operations monitoring will be required and additional rehabilitation will be performed when this standard has not been met. The KV plan for this sale will be amended to fund such work.

- BMP (T-10) - Old landings, skid trails, and temporary roads will be re-used where deemed practical by the timber sale administrator. This will reduce the cumulative amount of detrimentally compacted soil within the activity area.

Ability to Implement: High

Effectiveness: Moderate

- At least 250 linear feet of logs per acre will be left in harvest units 7, 9, 12, 14, 19, 24, 27, 30, 33, 36, 37, 40-56, 60, 61, and 68 for coarse woody debris recruitment. 120 linear feet will be made up of down logs greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 1 and 2. This standard will be met by marking two green trees (live culls if available) per acre for leave and then felling the tree after slash treatment. In addition, four large diameter (>20" DBH) mountain hemlock/acre will be felled and left within the groups in order to approximate the high down wood levels associated with laminated root disease pockets in the mountain hemlock zone. This includes units 16-18, 20-23 and unit 19 which is prescribed as a seed tree harvest. These trees can be dispersed throughout the harvest area or clumped. KV funds will be collected to fell these trees within proposed harvest units. The District wildlife biologist will determine the number and location of trees to be felled. The remaining 130 linear feet will be made up of either down logs in decay class 3, snags, or live green culls greater than or equal to 20 inches in diameter (small end) and 10 feet long in decay classes 1 through 6; or standing green trees of average stand diameter if the previously mentioned material is not available.
- Existing coarse woody debris already on the ground before harvest will be retained and protected to the greatest extent possible in all proposed harvest units. Existing coarse woody debris greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 3 and 4 will be marked for leave by the presale crew in leave tree marked units. Contract Provision: CT2.35#
- BMP (F-1, 2, 3) - To meet acceptable levels of surface soil loss resulting from gravity, water, or wind on timber harvest units, no less than 65% effective ground cover in units with <30 percent slope and no less than 85% effective ground cover in units with >30 percent slope must exist within the first year following ground disturbing activities for all proposed units. Low intensity burns and slash piling specifications will be implemented in order to meet effective ground cover standard. In addition to the above, units 3 and 5 will have no less than 85% effective ground cover outside of groups, but no more than 65% within groups in order to facilitate natural regeneration of ponderosa pine. Contract Provision: CT6.74 (Option 1)

Ability to Implement: High

Effectiveness: High (b, c)

- BMP (T-10,11,13,14,15,16,18,19;R-2,3,5,6,7,8,9,20;VM-3,4) - The following contract provisions dealing with soil erosion will be required: Erosion Prevention and Control BT6.6, Temporary Roads BT6.62, Landings BT6.63, Skid Trails and Fire lines BT6.64, Current Operating Areas BT6.65, Erosion Control Structure Maintenance BT6.66

Ability to Implement: High

Effectiveness: High (c)

- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator.

WATERSHED

- BMP (T-7,8) – Stream course protection BT6.5 and Special Felling Objectives CT6.41 will be required for units 1-7, 9-11, 14, 15, 18, 20, 22, 24, 25, 26, 31, 32, 40, 50, 51, 54, 55 and 67A & B in order to protect stream bank stability, riparian trees, and riparian vegetation.

Ability to implement: High

Effectiveness: high (c)

- BMP (T-7) – Riparian reserve widths, as described in the Riparian Area Summary located in Appendix D, will be required for Class III and IV streams adjacent to units 1-7, 9-11, 14, 15, 18, 20, 22, 24, 25, 26, 31, 32, 40, 50, 51, 54, 55 and 67A & B. Riparian reserves widths will be based on the measurement of two old growth site potential trees within the riparian reserve. Riparian reserves are required in order to maintain stream bank stability, effective shade, and standing trees for future large woody material recruitment.

Ability to implement: High

Effectiveness: high (a, c, d)

- BMP (W-4) – Oil and Hazardous substance spill prevention and Countermeasures Plan (SPCC) will be required. Contract Provision: CT6.341

Ability to implement: High

Effectiveness: high (c)

- BMP (F-2,3,4,5) – Riparian reserves adjacent to units 1-7, 9-11, 14, 15, 18, 20, 22, 24, 25, 26, 31, 32, 40, 50, 51, 54, 55, and 67A & B will be protected from prescribed fire.

Ability to implement: High

Effectiveness: high (a,c,d)

WILDLIFE AND BOTANY

- All existing snags greater than 15” DBH will be left in harvested areas, unless deemed a safety hazard by the sale administrator. Existing snags will be marked for leave by the presale crew within all leave tree marked harvest units. KV funds will be collected to create snags within sale areas through either topping or inoculation treatment. All other harvest units will retain the standard 3 green trees per acre. These green trees are being left for snag recruitment through natural mortality over the next three decades. As a minimum, snags will be retained within the proposed units at levels sufficient to support species of cavity nesting birds at 60 percent of potential population levels based on published guidelines and models. The Westside version of the Snag Recruitment Simulator has calculated this level to be 2.13 hard snags per acre and 0.15 soft snags per acre greater than 15 inches in diameter for the species living in forested habitats around the Lemolo Watershed Projects Analysis area.
- KV funds will be collected to control or eradicate noxious weed populations within sale areas.

- KV funds will be collected to manage for the potential of future noxious weed populations within sale areas.
- KV funds will be collected to re-vegetate disturbed areas within sale areas.
- KV funds will be collected to construct wildlife road closures within sale areas.
- KV funds will be collected to do forage enhancement within sale areas.
- KV funds will be collected to do riparian restoration within sale areas.
- KV funds will be collected to do natural opening maintenance within sale areas.
- KV funds will be collected to install water guzzlers within sale areas.
- KV funds will be collected to create denning habitat within sale areas.
- Scattered remnant old growth trees within commercial thinning harvest units 1, 3, 4, 6, 10, 11, 13, 15, 25, 26, 28, 29, 31, 32, 34, 35, 38, 39 and 67A & B will be retained for structural diversity, future snag recruitment, and future large woody material recruitment; and to protect the small diameter thinning stand from logging damage.
- District wildlife biologists will assist the presale crew in the location and marking of leave groups and snag recruitment trees.
- At least fifteen percent of the area associated with units 19, 42 – 56, 60 and 61 will be retained in groups .5 acres or more in size. Ten and a half percent of the area associated with units 2, 5, 7, 9, 12, 14, 16, 17, 18, 20 – 24, 27, 30, 33, 36, 37, 40, 41, 57 – 59, 62 – 64, and 68 will be retained in groups 0.5 acres to 2.5 acres or more in size. The remaining four percent will be retained as dispersed trees. Larger groups 2.5 acres or greater in size are preferable. To the extent possible, groups and dispersed retention should include the largest, oldest live trees, decadent or leaning trees, and hard snags occurring in the unit. The boundary of leave groups will be designated with aluminum flashers stating that the area is a leave group. Leave groups will be tracked through GIS.
- A seasonal restriction will be applied to units 1-7, 9-17, 24-34, 40, 51, 58, 59 and 67 A&B based on consultation with the U.S. Fish and Wildlife Service on the northern spotted owl and bald eagle. Harvest restrictions between March 1 and July 15 will be required for units 1-7, 9-12, 16, 17, 19, 27 – 29, 32, 35 – 41, 53, 57, 59, 63 and 68 to prevent disturbance take, unless spotted owl nesting is not confirmed during the planned harvest year. Nesting confirmation will involve 3 complete visits to the core area, April 1 – June 1, during the planned harvest year. CT6.25#
- Harvest restrictions between January 1 and August 31 will be required for units 1 through 6 and 32 to prevent disturbance to bald eagle nesting, unless nesting is not confirmed during the planned harvest year. Inventory requirements may be changed based on requirements from USFWS. CT6.25#

- A 100 foot radius buffer zone is required around each *Cladonia norvegica* and *Ramaria rubrievanescens* (Survey and Manage fungi) location within units 11, 22 and 25.
- A 100 foot radius buffer zone is required around each *Buxbaumia aphylla* location within units 28.
- Extreme care should be taken on the south end of unit 75 to make sure that burn piles stay in control and that fire does not inundate the adjacent riparian area and adversely affect a known population of *Tritomaria exsectiformis* (Survey and Manage bryophyte).
- The western most portion of unit 74 will be dropped in order to protect a very rare unique form of *Peltigera hydrothyria* (Green Photomorph). This involves leaving a 300 foot buffer boundary on the adjacent riparian area. Extreme care should be taken to make sure underburning stays in control and does not enter the 300 foot buffer.
- Leave groups will be located around populations of *Asarum wagneri* within units 50, 53, 63 and 64 in such a way that they cover the greatest densities of populations.
- Biological evaluations have been conducted for threatened, endangered, and sensitive species. Threatened, endangered, and sensitive species will be protected if found during timber sale operations. Contract Provision: CT6.25#

FIRE MANAGEMENT

- Logging slash will be disposed of to meet Umpqua N.F. fire hazard fuel residue management guidelines on all proposed units, if the post harvest fuels survey determines it is necessary for fuels hazard reduction. Specifics may be found in Appendix E.
- If loader piling or hand piling is designated for the unit, piles will be located on temporary haul roads or designated loader roads where possible. A small loader weighing less than 45,000 lbs. with at least a 25 foot reach will be required for all loader slash piling. All logs or log chunks left after harvest that are greater than or equal to 6 inches in diameter (small end) will be excluded from slash piles and scattered evenly throughout harvested areas.
- KV funds will be collected to accomplish prescribed fire objectives in units 69, 70, 71, 73-A, 73-B, 74, 75, and 76.
- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment in harvested areas.
- Underburning within units 69, 70, 71, and 74 will occur when conditions are such that dominant and codominant trees will survive the burn. Hand piling and burning within unit 73A, 73 B, 75 and 76 will occur when conditions are such that dominant and codominant trees will survive the burn.
- Underburning in unit 69 will exclude Lake Creek riparian area, creating a mid-slope unit boundary.

- All non merchantable white fir will be whip felled in units 5, 7, 9, 12, 14 and 24, All non merchantable white fir and western hemlock will be whip felled in unit 68 and the north half of unit 27.
- Yarding of tops will be required in unit 1 to reduce fuel loading.
- Slash pull back will be required around Douglas-fir between 14 – 22 inches DBH in units 7, 14 and 68 and around white pine and Englemann spruce in unit 36 and 37.
- Small diameter (8-12 inch DBH) down lodge pole and white pine will be YUM yarded and decked for public firewood cutting in units 26 and 28.
- Unit 70 has an unnamed class III and IV stream on the east side of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- Unit 71 has an unnamed class IV stream on the west side and one in the middle of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- Hand piling and burning will occur within the class IV riparian area for unit 73-B.
- The class IV riparian area on the west side of unit 74 will be buffered with a buffer at least 300 feet.
- A class IV riparian reserve exists inside unit 75 and will receive hand pile, swamper and jackpot burning. Fire activity within the riparian reserve will not consume large woody debris, kill riparian vegetation providing shade, and not consume the duff layer.
- All burning will comply with federal, state, and local air quality regulations.

SILVICULTURAL ACTIVITIES – POST HARVEST

- KV funds will be collected to pre-commercial thin overstocked existing plantations and natural stands within the sale area.
- Reforestation methods, which include planting and natural regeneration, will be used to establish trees on harvested areas within five years. Species will be those that are common to the area. Site specific information may be found in the prescription located in Appendix I. Mycorrhizal root dip gel will be used on all planted seedlings.
- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted harvest units, skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator. The return of organic material to treated areas will be subject to material availability or prescribed amendments.
- KV funds will be collected to prune 5 needle pine species for blister rust control within the sale areas.

- KV funds will be collected to perform animal damage control in 7, 9, 12, 14, 19, 24, 27, 30, 33, 36, 37, 40-56, 60, 61, and 68.

2.5 ALTERNATIVE 3

The IDT developed this alternative to address some public's concern about timber harvest near Lemolo Lake and other areas within the project analysis area that have high recreational value to them, while still trying to meet Purpose and Need. Harvest units 1-5, 7, 9, 14-24, 26, 27, 30, 32-41, 53-56, 68 and the east half of unit 25 below the 60 road and associated road construction and helicopter landings were dropped from the Proposed Action to formulate this alternative, in order to address some public's concern over recreational value. This alternative does not promote pine health, reduce fire hazard, or improve stand health and vigor on Bunker Hill, facing Lemolo Lake. It partially meets the Purpose and Need because it does not propose activities on this major part of the Lemolo landscape that has high fuel loadings and high risk of fire, high density stands, and old growth ponderosa pine that are declining in health and vigor due to under story conifer encroachment.

2.5.1 ACTIVITIES UNDER ALTERNATIVE 3

TIMBER HARVEST AND ROAD WORK

Timber sales will harvest 172 acres using shelterwood and seed tree silvicultural prescriptions, commercially thin 374 acres, harvest 38 acres through small group selection, selectively harvest 42 acres for posts and poles, and harvest 10 acres for house logs using seed tree silvicultural prescriptions. These sales will supply timber to local and regional economies on a cost efficient, sustainable basis and help meet the probable sale quantity for the Umpqua National forest in 2004 and 2005. Timber harvest would produce approximately 8.7 million board feet. All timber harvest activities would meet current standards and guidelines for matrix lands. Artificial reforestation and/or natural regeneration will be used to establish new stands.¹ Four sales are planned to be sold in 2004 and 2005 and operate for 2-3 years. Logging systems will be a combination of skyline, helicopter, loader, and mechanical. Construction of two permanent helicopter landings will occur. No timber harvest will occur within inventoried road less areas, riparian reserves, unsuitable soils, the OCRA, cultural sites, or owl cores.

Approximately 2.46 miles of new system road construction, 19.18 miles of road reconstruction / maintenance, 0.29 miles of road decommissioning inside potential sale area boundaries, 10.73 miles of road decommissioning outside potential sale area boundaries, and 1.9 miles of temporary road construction and subsequent obliteration will occur under this alternative.

FUEL TREATMENT/FIRE HAZARD REDUCTION

Natural fuels and harvest activity fuels will be treated on 939 acres (303 acres of natural fuels) within the Lemolo watershed through underburning and pile burning. Fuel levels will be reduced to less than 21 tons/acre over the 939 acres. This will begin to move the Lemolo watershed from a high severity fire regime towards the historical moderate severity fire regime.

¹ More detail on silvicultural prescriptions can be found in the Silvicultural Prescription in Appendix I.

PINE HEALTH AND STAND DENSITY MANAGEMENT

Pine health will be promoted on 763 acres within the Lemolo watershed through silvicultural prescriptions that reduce stand densities around individual pine; regenerate harvested areas with blister rust resistant white pine and sugar pine, and ponderosa pine; and harvest greater than 80 year old lodge pole pine stands that are highly susceptible to a mountain pine beetle outbreak. Stand health and vigor will be improved on 452 acres of mixed conifer stands within the Lemolo watershed through commercial thinning prescriptions that reduce existing stand densities.

SITE PRODUCTIVITY

Site productivity will be improved on 264 acres of plantations within the Lemolo watershed through sub-soiling of old temporary roads, landings, and skid trails. KV funding will finance 21 acres of the 264 acres planned.

RECREATIONAL VALUE AND OLD GROWTH

Recreational value will not be reduced for some concerned publics, through timber harvest on - 0- acres surrounding the Lemolo Lake Recreation Area. Two acres of growth habitat will be harvested and converted to permanent openings in the form of roads.

Figure 2 – Alternative Three Map

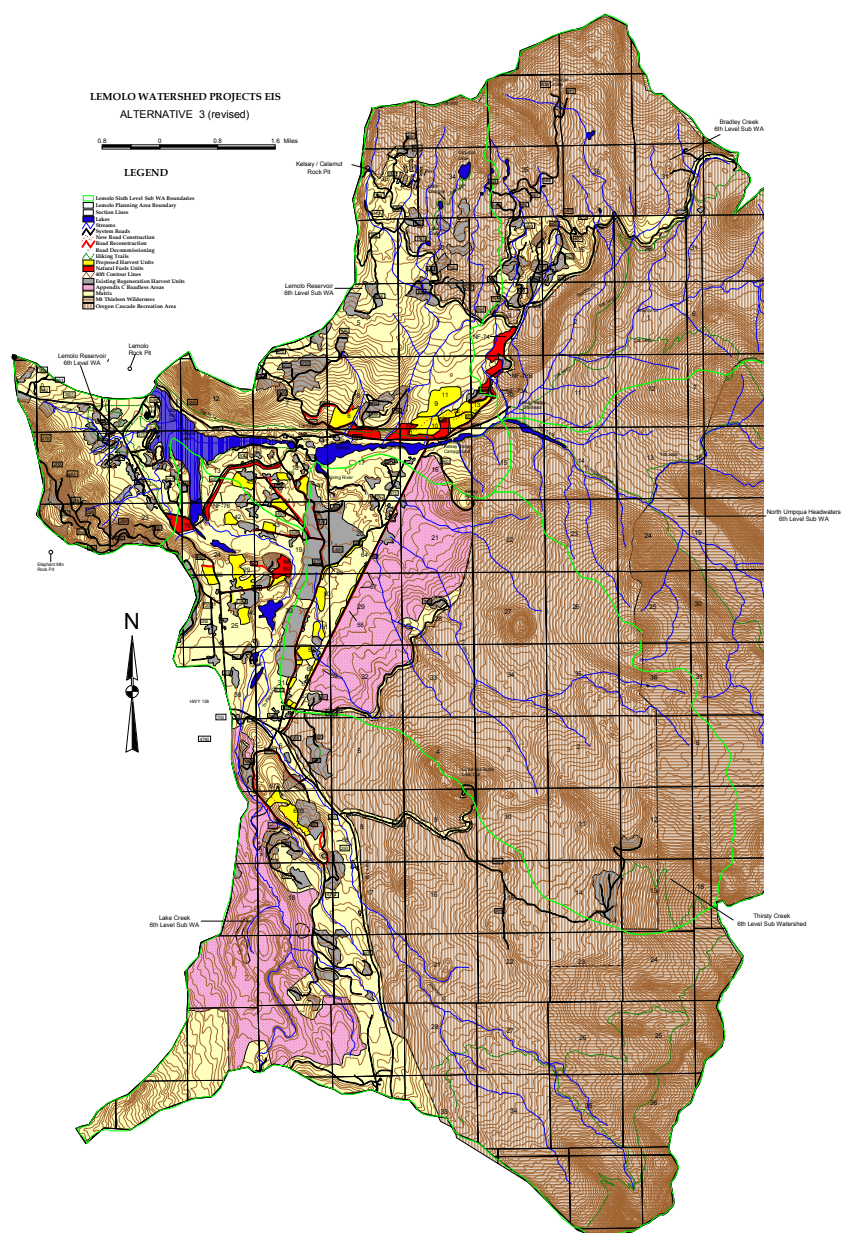


Table 2 – Alternative Three Unit Summary

UNIT #	SILV. RX	GROSS ACRES	NET ACRES	CUT VOLUME (mbf/ac)	UNIT VOL. (mbf)	LOGGING METHOD	FUELS TREATMENT
6	HTH/HGR	49	49	20	980	SKY/LL	UB
10	HTH/HGR	58	58	20	1160	SKY/LL	UB
11	HTH/HGR	82	82	15	1230	LL	HP/GP
12	HSH	16	14	40	544	LL	GP/WF
13	HTH/HGR	36	36	20	720	SKY/LL	HP
25	HTH/HGR	33	33	10	330	SKY/LL	HP
28	HTH	21	21	10	210	MEC	HP/YUM(LPP)
29	HTH/HGR	57	57	15	855	SKY/MEC	HP
31	HTH	14	14	15	210	MEC	HP
42	HCR	14	12	7	83	MEC	UB
43	HCR	13	11	7	77	MEC	UB
44	HCR	18	15	7	107	MEC	UB
45	HCR	29	25	7	173	MEC	UB
46	HCR	9	8	7	54	MEC	UB
47	HCR	15	13	7	89	MEC	UB
49	HCR	19	16	7	113	MEC	UB
50	HCR	25	21	7	149	MEC	UB
51	HCR	20	17	7	119	MEC	UB
52	HCR	23	20	7	137	MEC	UB
57	HPR*	11	10	1	10	MEC	HP
58	HPR*	4	4	1	4	MEC	HP
59	HPR*	9	8	1	8	MEC	HP
60	HCR*	3	2	5	10	MEC	HP/GP/UB
61	HCR*	9	8	5	38	MEC	HP/GP/UB
62	HPR*	7	6	1	6	MEC	HP
63	HPR*	7	6	1	6	MEC	HP
64	HPR*	9	8	1	8	MEC	HP
67-A	HTH/HGR	39	39	20	780	SKY/LL	HP
67-B	HTH/HGR	23	23	20	460	SKY/LL	HP
Total			636		8,670		

HPR* - Post & Pole harvest
HSH – Shelterwood (8-12 tpa)
HCR – Seed tree (4-6 tpa)
HTH –Thinning
HCR* - House log harvest
HGR – Small group harvest

New System Road Construction 2.46 miles
System Road Reconstruction / Maintenance 19.18 miles
System Road Decommissioning 11.02 miles

UB – Underburning
HP – Hand pile
GP- Grapple pile
WF – Whip fall
YUM – Yard unutilized material

HEL – Helicopter
MEC – Mechanical Logging
LL – Loader Logging
SKY – Skyline Logging

2.5.2 BEST MANAGEMENT PRACTICES, MANAGEMENT REQUIREMENTS AND MITIGATING MEASURES

The following best management practices, management requirements, and mitigating measures will be implemented in order to meet the Standards and Guidelines in the Umpqua National Forest Land and Resource Management Plan, as amended. In most cases, they have been designed to reduce or eliminate potential environmental effects. General Water Quality Best Management Practices (USDA-FS 1988) are prescribed to protect beneficial uses and meet water quality objectives. A cross reference to the Pacific Northwest Regional Guide is included with each best management practice (BMP). The BMPs are rated by their ability to implement and their effectiveness as defined by the 1988 Pacific Northwest Regional BMP Guide. The interdisciplinary team determined ratings. The possible ratings are as follows:

ABILITY TO IMPLEMENT

- High - Almost certain the BMP can be implemented.
- Moderate - Greater than 75% certainty the BMP can be implemented as planned.
- Low - Less than 75% certainty the BMP can be implemented as planned.

EFFECTIVENESS

- High - BMP is highly effective (>90%) based on one or more of the following types of documentation:
 - a) Literature/Research applicable to area.
 - b) Administrative Studies applicable to area.
 - c) Experience - judgment of an expert by education and/or experience.
 - d) Fact - obvious by reasoned (logical) response.
- Moderate - Documentation shows that the BMP is effective less than 90% of the time but at least 75% of the time or logic indicates that the BMP is highly effective but there is little or no documentation to back it up.
- Low - Effectiveness unknown or unverified and there is little or no documentation or applied logic is uncertain in this case or the BMP is estimated to be less than 75% effective.

LOGGING SYSTEMS AND TIMBER SALE REQUIREMENTS

- BMP (T-5,R-3) – Normal operating season will be from June 1 through October 31. Operations outside the normal operating season are permitted only when they can be conducted without resource damage. Contract provisions: AT17, BT6.31, BT6.65, BT8.21, BT9.3

Ability to Implement: High

Effectiveness: High (c, d)

- BMP (T-17, 21, 22; VM-2) – The following contract provisions will be required: Meadow Protection BT6.61, Sanitation and Servicing BT6.34, Contract Modification BT8.3

Ability to Implement: High

Effectiveness: High (d)

- BMP (T-4) - The following features will be designated on the Sale Area Map: all stream courses to be protected, unit boundaries, specified system roads, restricted haul routes, improvements, yarding methods, rock sources.

Ability to Implement: High

Effectiveness: High (d)

- Cultural resources will be protected if found during logging or road construction. Contract Provision: CT6.24#
- Prior to all operations and prior to unit boundary changes, the sale administrator and engineering representative will confer with the Heritage Program Manager. Any unit boundary changes made by the sale administrator due to logging feasibility will be tracked through GIS.
- BMP (T-9,11;VM-1) - A tracked loader machine with at least a 35 foot boom will be used for yarding operations in order to minimize soil displacement and compaction in units 11, 12 and portions of units 6, 10, 13, 25, and 67A & B. Equipment will be restricted to designated loader paths and temporary haul roads approved by the sale administrator. Designated loader paths should be spaced an average of 100 feet apart. Designated temporary haul roads should be located at least 400 feet apart. The tracks on the loader will operate in a straight line, thus reducing soil displacement. Directional felling will be required into designated loader paths. Contract Provision; CT6.42#, CT6.4

Ability to Implement: High

Effectiveness: Moderate

- Protection of genetic trees and other reserve trees will be required. Contract provision: CT2.301#
- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment and reforestation.
- BMP (T-9, 11; VM-1) – A mechanized logging system will be used for felling and yarding operations in units 28, 29, 31, 42-47 and 49-52, 57-64. Equipment causing detrimental soil impacts will be restricted to designated paths spaced an average of 100 feet apart. Contract Provision CT6.42#, CT6.4
- To avoid noxious weed introduction, heavy equipment will be cleaned prior to entering the sale area. Contract Provision: CT6.343 (Option 2)
- BMP (T-12) - One end suspension and 75 foot lateral yarding will be required on portions of skyline yarded units 6, 10, 13, 25, 29, and 67A & B to limit soil displacement. Contract Provision; CT6.42#

Ability to Implement: High

Effectiveness: High (c)

- To avoid damage to leave trees due to bark slippage, operations will be restricted to July 15 through October 31 in units To avoid damage to leave trees due to bark slippage,

operations will be restricted to July 15 through October 31 in units 6, 10, 11, 13, 25, 28, 29, 31 and 67A & B. Contract Provision; CT6.315#

RECREATION

- No commercial vehicles over 20,000 lbs will be allowed on the 2612 road from the junction of the 2610 to the 2614 roads and the 2614 road starting at the junction with the 2610 to the 2612 roads. This will reduce the conflict with recreation use.
- Recreation and forest users will be notified of all activities associated with logging operations through signing. The signs will be placed throughout the project area.

TRANSPORTATION SYSTEM

- BMP (T-15, 16; R-18, 23; W-8) - Temporary roads in units 6, 10, 11, 12, 13, 25, 28, 29, 31, 42-47 and 49-52, and 67A & B will be obliterated following logging use. They will be sub-soiled to 20 inches with an excavator to prepare a seedbed and allow for water drainage.

Ability to Implement: Moderate

Effectiveness: Moderate

- Temporary roads constructed in units 28, 29 and 31 will be left open to maintain short-term access to portions of the unit for post-sale treatments but will be obliterated when this work is complete. Contract Provision; CT6.621
- Excavated material will be pulled back and stabilized as close to the original ground profile as possible. Stumps and slash will be placed back over 75% of the road surface for erosion control purposes. Contract Provisions: CT5.1# (Option 1)

Ability to Implement: High

Effectiveness: High (b, c, d)

- Road use restrictions will conform to Umpqua National Forest direction.
- Road specifications and maintenance levels for construction and reconstruction will be prescribed in the road management objectives.
- BMP (R-18;W-8) – Roads 2610-222, 345, 347, 350, 634; 2614-454, 455, 456; 4792-200; 6000-620, 621, 622, 631, 742, 743, 746, 750, 751, 920, 921, 930, 934, 936, 940, 950, 972 and 973 will be closed with rocks, earth berms, or gates following logging use in order to reduce erosion and the need for road maintenance. CT5.43

Ability to Implement: High

Effectiveness: High (d)

- BMP (R-2,4,5,8,9) – Erosion control will be required during construction of temporary roads in units 6, 10, 11, 12, 13, 25, 28, 29, 31, 42-47 and 49-52, 67A & B; and system roads 2610-347; 4792-201; 6000-951, and 952. Erosion control will also be required during the reconstruction / maintenance of system roads 2610-200, 222, 345, 346, 347, 350; 2614-430, 454, 455, 456; 4700-700; 4790; 4792, 4792-000, 200; 6000, 620, 621, 630, 631, 700, 742, 746, 750, 751, 930, 934,

936, 940, 945, 950, 960, 970, 971, 972 and 973. Specific measures include timing of construction, berms, and slope drains and insuring drainage structures are in place before each rainy season. Grass seeding will not be required on roads located above 4500 feet in elevation. Contract Provision: BT6.6, CT6.6#, and Standard and Special Specifications for Construction are required.

Ability to Implement: Moderate

Effectiveness: Moderate

- BMP (R-1) – The location, design, and construction of temporary roads in units 6, 10, 11, 12, 13, 25, 28, 29, 31, 42-47 and 49-52, 67A &; and system roads 2610-346, 347; 4792-201; 6000-951, and 952 will be accomplished with minimal resource damage. Contract Provision: CT5.1# (Option 1)

Ability to Implement: high

Effectiveness: High (c)

- BMP (R-20) – Traffic will be controlled during wet weather to prevent erosion and damage to roads. Contract Provision: CT5.12#
- BMP – KV funds will be collected to decommission system roads 2610-345 and 346; 2614-450, 460, 470; 6000-745, 750, 753, 754 and 932.

SOILS

- BMP (T-6) - Lands identified as technically unsuitable for timber production will be entered in GIS.

Ability to Implement: High

Effectiveness: High (d)

- The combined total areas of detrimentally compacted, displaced, puddled, and severely burned soil within an activity area will not exceed 20 percent. All roads and landings, unless rehabilitated to acceptable conditions, are considered to be in detrimental condition and are included as part of this 20 percent. Post-operations monitoring will be required and additional rehabilitation will be performed when this standard has not been met. The KV plan for this sale will be amended to fund such work.
- BMP (T-10) - Old landings, skid trails, and temporary roads will be re-used where deemed practical by the timber sale administrator. This will reduce the cumulative amount of detrimentally compacted soil within the activity area.

Ability to Implement: High

Effectiveness: Moderate

- At least 250 linear feet of logs per acre will be left in harvest units 12, 42-47, 52, 60 and 61 for coarse woody debris recruitment. 120 linear feet will be made up of down logs greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 1 and 2. This standard will be met by marking two green trees (live culls if available) per acre for leave and then felling the tree after slash treatment. KV funds will be collected to fell these trees within proposed harvest units. The District wildlife biologist will determine the number and location of trees to be felled. The remaining 130 linear feet will be made up of either down logs in decay class 3, snags, or live green culls greater than or equal to 20

inches in diameter (small end) and 10 feet long in decay classes 1 through 6; or standing green trees of average stand diameter if the previously mentioned material is not available.

- Existing coarse woody debris already on the ground before harvest will be retained and protected to the greatest extent possible in all proposed harvest units. Existing coarse woody debris greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 3 and 4 will be marked for leave by the presale crew in leave tree marked units. Contract Provision: CT2.35#
- BMP (F-1, 2, 3) - To meet acceptable levels of surface soil loss resulting from gravity, water, or wind on timber harvest units, no less than 65% effective ground cover in units with <30 percent slope and no less than 85% effective ground cover in units with >30 percent slope must exist within the first year following ground disturbing activities for all proposed units. Low intensity burns and slash piling specifications will be implemented in order to meet effective ground cover standard. Contract Provision: CT6.74 (Option 1)

Ability to Implement: High

Effectiveness: High (back)

- BMP (T-10,11,13,14,15,16,18,19;R-2,3,5,6,7,8,9,20;VM-3,4) - The following contract provisions dealing with soil erosion will be required: Erosion Prevention and Control BT6.6, Temporary Roads BT6.62, Landings BT6.63, Skid Trails and Fire lines BT6.64, Current Operating Areas BT6.65, Erosion Control Structure Maintenance BT6.66

Ability to Implement: High

Effectiveness: High (c)

- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator.

WATERSHED

- BMP (T-7,8) - Stream course Protection BT6.5 and Special Falling Objectives CT6.41 will be required for units 6, 10, 11, 25, 31, 50, 51, and 67A & B in order to protect stream bank stability, riparian trees, and riparian vegetation.

Ability to Implement: High

Effectiveness: High (c)

- BMP (T-7) - Riparian reserve widths, as described in the Riparian Area Summary located in Appendix D, will be required for the Class III and IV streams adjacent to units 6, 10, 11, 25, 31, 50, 51, and 67A & B. The riparian reserve widths will be based on the measurement of two old growth site potential trees within the riparian reserve. Riparian reserves are required in order to maintain stream bank stability, effective shade, and standing trees for future large woody material recruitment.

Ability to Implement: High

Effectiveness: High (a, c, d)

- BMP (W-4) - Oil and Hazardous Substance Spill Prevention and Countermeasures Plan (SPCC) will be required. Contract Provision: CT6.341

Ability to Implement: High

Effectiveness: High (c)

- BMP (F-2, 3, 4, 5) - Riparian Reserves adjacent to units 6, 10, 11, 25, 31, 50, 51, and 67A & B will be protected from prescribed fire.

Ability to Implement: High

Effectiveness: High (a, c, d)

WILDLIFE AND BOTANY

- KV funds will be collected to control or eradicate noxious weed populations within sale areas.
- KV funds will be collected to manage for the potential of future noxious weed populations within sale areas.
- KV funds will be collected to re-vegetate disturbed areas within sale areas.
- KV funds will be collected to construct wildlife road closures within sale areas.
- KV funds will be collected to do forage enhancement within sale areas.
- KV funds will be collected to do riparian restoration within sale areas.
- KV funds will be collected to do natural opening maintenance within sale areas.
- KV funds will be collected to install water guzzlers within sale areas.
- KV funds will be collected to create denning habitat within sale areas.
- All existing snags greater than 15" DBH will be left in harvested areas, unless deemed a safety hazard by the sale administrator. Existing snags will be marked for leave by the presale crew within all leave tree marked harvest units. KV funds will be collected to create snags within sale areas through either topping or inoculation treatment. All other harvest units will retain the standard 3 green trees per acre. These green trees are being left for snag recruitment through natural mortality over the next three decades. As a minimum, snags will be retained within the proposed units at levels sufficient to support species of cavity nesting birds at 60 percent of potential population levels based on published guidelines and models. The Westside version of the Snag Recruitment Simulator has calculated this level to be 2.13 hard snags per acre and 0.15 soft snags per acre greater than 15 inches in diameter for the species living in forested habitats around the Lemolo Watershed Projects Analysis area.
- Scattered remnant old growth trees within commercial thinning harvest units 6, 10, 11, 13, 25, 28, 29, 31 and 67A & B will be retained for structural diversity, future snag recruitment, and future large woody material recruitment; and to protect the small diameter thinning stand from logging damage.
- District wildlife biologists will assist the presale crew in the location and marking of leave groups and snag recruitment trees.

- At least fifteen percent of the area associated with units 42-47, 49-52, 60 and 61 will be retained in groups 0.5 acres or more in size. Ten and a half percent of the area associated with units 12, 57-59 and 62-64, will be retained in groups 0.5 acres to 2.5 acres or more in size. The remaining four percent will be retained as dispersed trees. Larger groups 2.5 acres or greater in size are preferable. To the extent possible, groups and dispersed retention should include the largest, oldest live trees, decadent or leaning trees, and hard snags occurring in the unit. The boundary of leave groups will be designated with aluminum flashers stating that the area is a leave group. Leave groups will be tracked through GIS.
- A seasonal restriction will be applied to units 6, 10, 11, 12, 13, 25, 28, 31, 51, 58, 59 and 67A & B based on consultation with the U.S. Fish and Wildlife Service on the northern spotted owl. Harvest restrictions between March 1 and July 15 will be required for units 10-12, 19, 28, 29, 57, 59, and 63, and 64 to prevent disturbance take, unless spotted owl nesting is not confirmed during the planned harvest year. Nesting confirmation will involve 3 complete visits to the core area, April 1 – June 1, during the planned harvest year. Inventory requirements may be changed based on requirements from USFWS. CT6.25#
- Harvest restrictions between January 1 and August 31 will be required for unit 6 to prevent disturbance to bald eagle nesting, unless nesting is not confirmed during the planned harvest year. Inventory requirements may be changed based on requirements from USFWS. CT6.25#
- A 100 foot radius buffer zone is required around each *Cladonia norvegica* and *Ramaria rubrievanescens* (Survey and Manage fungi) location within units 11 and 25.
- A 100 foot radius buffer zone is required around each *Buxbaumia aphylla* location within units 28.
- Extreme care should be taken on the south end of unit 75 to make sure that burn piles stay in control and that fire does not inundate the adjacent riparian area and adversely affect a known population of *Tritomaria exsectiformis* (Survey and Manage bryophyte).
- The western most portion of unit 74 will be dropped in order to protect a very rare unique form of *Peltigera hydrothyria* (Green Photomorph). This involves leaving a 300 foot buffer boundary on the adjacent riparian area. Extreme care should be taken to make sure underburning stays in control and does not enter the 300 foot buffer.
- Leave groups will be located around populations of *Asarum wagneri* within units 50, 63 and 64 in such a way that they cover the greatest densities of populations.
- Biological evaluations have been conducted for threatened, endangered, and sensitive species. Threatened, endangered, and sensitive species will be protected if found during timber sale operations. Contract Provision: CT6.25#

FIRE MANAGEMENT

- Logging slash will be disposed of to meet Umpqua National Forest fire hazard guidelines on all proposed units, if the post harvest fuels survey determines it is necessary for fuels hazard reduction. Specifics may be found in Appendix E.
- If loader piling or hand piling is designated for the unit, piles will be located on temporary haul roads or designated loader roads where possible. A small loader weighing less than 45,000 lbs. with at least a 25 foot reach will be required for all loader slash piling. All logs or log chunks left after harvest that are greater than or equal to 9 inches in diameter (small end) will be excluded from slash piles and scattered evenly throughout harvested areas.
- KV funds will be collected to accomplish prescribed fire objectives in units 24, 69, 70, 71, 73-A, and 76 and other funds will be used to accomplish prescribed fire objectives in units 14, 73-B, 74 and 75.
- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment in harvested areas.
- Underburning within units 14, 24, 69, 70, 71, 74 and 75 will occur when conditions are such that dominant and codominant trees will survive the burn. Hand piling and burning within unit 73 and 76 will occur when conditions are such that dominant and codominant trees will survive the burn.
- Underburning in unit 69 will exclude Lake Creek riparian area, creating a mid-slope unit boundary.
- Unit 70 has an unnamed class III and IV stream on the east side of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- Unit 71 has an unnamed class IV stream on the west side and one in the middle of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- Hand piling and burning will occur within the class IV riparian area for unit 73-B.
- The class IV riparian area on the west side of unit 74 will be buffered with a buffer at least 300 feet.
- A class IV riparian reserve exists inside unit 75 and will receive hand pile, swamper and jackpot burning. Fire activity within the riparian reserve will not consume large woody debris, kill riparian vegetation providing shade, and not consume the duff layer.
- All burning will comply with federal, state, and local air quality regulations.
- All non merchantable white fir will be whip felled in unit 12.
- Small diameter (8-12 inch DBH) down lodge pole and white pine will be YUM yarded and decked for public firewood cutting in unit 28.

SILVICULTURAL ACTIVITIES – POST HARVEST

- KV funds will be collected to pre-commercial thin overstocked existing plantations and natural stands within the sale area.
- Reforestation methods, which include planting and natural regeneration, will be used to establish trees on harvested areas within five years. Species will be those that are common to the area. Site specific information may be found in the prescription located in Appendix I. Mycorrhizal root dip jell will be used on all planted seedlings.
- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted harvest units, skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator. The return of organic material to treated areas will be subject to material availability or prescribed amendments.
- KV funds will be collected to prune 5 needle pine species for blister rust control within the sale areas.
- KV funds will be collected to perform animal damage control in 12, 42-47, 49-52, 60 and 61.

2.6 ALTERNATIVE 4

The IDT developed this alternative to address some public's concern about timber harvest of old growth stands within the project analysis area, while still trying to meet Purpose and Need. Harvest units 2, 3, 5, 7, 9, 14-24, 26, 27, 30, 32-34, 36, 37, 40, 41, 68 and associated road construction were dropped from the Proposed Action to formulate this alternative, in order to address some public's concern over old growth values. This alternative does not promote pine health on Bunker Hill, facing Lemolo Lake. It partially meets the Purpose and Need because it does not propose silvicultural activities on this major part of the Lemolo landscape that has old growth ponderosa pine that are declining in health and vigor due to under story conifer encroachment.

2.6.1 ACTIVITIES UNDER ALTERNATIVE 4

TIMBER HARVEST AND ROAD WORK

Timber sales will harvest 254 acres using shelterwood and seed tree silvicultural prescriptions, commercially thin 553 acres, harvest 44 acres through small group selection, selectively harvest 42 acres for posts and poles, and harvest 10 acres for house logs using seed tree silvicultural prescriptions. These sales will supply timber to local and regional economies on a cost efficient, sustainable basis and help meet the probable sale quantity for the Umpqua National forest in 2004 and 2005. Timber harvest would produce approximately 12.7 million board feet. All timber harvest activities would meet current standards and guidelines for matrix lands. Artificial reforestation and/or natural regeneration will be used to establish new stands. More detail on silvicultural prescriptions can be found in the Silvicultural Prescription in Appendix I. Four sales are planned to be sold in 2004 and 2005 and operate for 2-3 years. Logging systems will be a combination of skyline, helicopter, loader, and mechanical. Construction of two permanent helicopter landings will occur. No timber harvest will occur within inventoried road less areas, riparian reserves, unsuitable soils, the OCRA, cultural sites, or owl cores.

Approximately 2.97 miles of new system road construction, 23.84 miles of road reconstruction/maintenance, 1.99 miles of road decommissioning inside potential sale area boundaries, 9.43 miles of road decommissioning outside potential sale area boundaries, 2.5 miles of temporary road construction and subsequent obliteration, and 2 acres of helicopter landing construction will occur under this alternative.

FUEL TREATMENT/FIRE HAZARD REDUCTION

Natural fuels and harvest activity fuels will be treated on 1,208 acres (303 acres of natural fuels) within the Lemolo watershed through underburning and pile burning. Fuel levels will be reduced to less than 21 tons/acre over the 1,208 acres. This will begin to move the Lemolo watershed from a high severity fire regime towards the historical moderate severity fire regime.

PINE HEALTH AND STAND DENSITY MANAGEMENT

Pine health will be promoted on 1032 acres within the Lemolo watershed through silvicultural prescriptions that reduce stand densities around individual pine; regenerate harvested areas with blister rust resistant white pine and sugar pine, and ponderosa pine; and harvest greater than 80

year old lodge pole pine stands that are highly susceptible to a mountain pine beetle outbreak. Stand health and vigor will be improved on 553 acres of mixed conifer stands within the Lemolo watershed through commercial thinning prescriptions that reduce existing stand densities.

SITE PRODUCTIVITY

Site productivity will be improved on 264 acres of plantations within the Lemolo watershed through subsoiling of old temporary roads, landings, and skid trails. KV funding will finance 25 acres of the 264 acres planned.

RECREATIONAL VALUE AND OLD GROWTH

Recreational value will be reduced for some concerned publics, through timber harvest on 267 acres surrounding the Lemolo Lake Recreation Area. Three acres of old growth habitat will be harvested and converted to permanent openings in the form of roads and a helicopter landing.

Figure 3 – Alternative Four Map

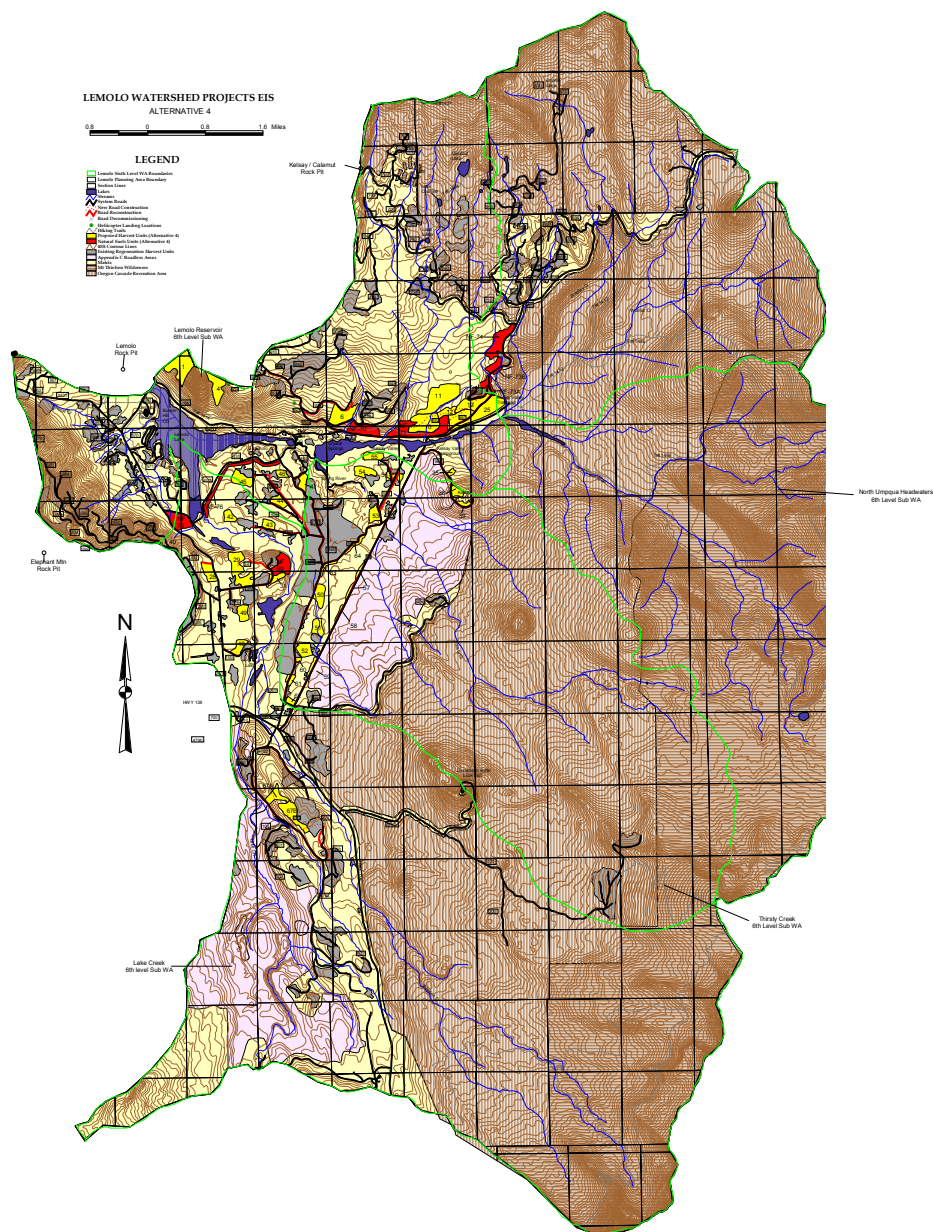


Table 3 – Alternative Four Unit Summary

UNIT #	SILV. RX	GROSS ACRES	NET ACRES	CUT VOLUME (mbf/ac)	UNIT VOL. (mbf)	LOGGING METHOD	FUELS TREATMENT
1	HTH	62	62	25	1550	HEL	HP/YT
4	HTH	40	40	20	800	HEL	HP
6	HTH/HGR	49	49	20	980	SKY/LL	UB
10	HTH/HGR	58	58	20	1160	SKY/LL	UB
11	HTH/HGR	82	82	15	1230	LL	HP/GP
12	HSH	16	14	40	544	LL	GP/WF
13	HTH/HGR	36	36	20	720	SKY/LL	HP
25	HTH/HGR	93	93	10	930	SKY/LL	HP
28	HTH	21	21	10	210	MEC	HP/YUM(LPP)
29	HTH/HGR	57	57	15	855	SKY/MEC	HP
31	HTH	14	14	15	210	MEC	HP
35	HTH	5	5	10	50	MEC	HP
38	HTH	12	12	20	240	SKY	UB
39	HTH	6	6	25	150	SKY	UB
42	HCR	14	12	7	83	MEC	UB
43	HCR	13	11	7	77	MEC	UB
44	HCR	18	15	7	107	MEC	UB
45	HCR	29	25	7	173	MEC	UB
46	HCR	9	8	7	54	MEC	UB
47	HCR	15	13	7	89	MEC	UB
48	HCR	27	23	7	161	MEC	UB
49	HCR	19	16	7	113	MEC	UB
50	HCR	25	21	7	149	MEC	UB
51	HCR	20	17	7	119	MEC	UB
52	HCR	23	20	7	137	MEC	UB
53	HCR	18	15	7	107	MEC	UB
54	HCR	22	19	7	131	MEC	UB
55	HCR	17	14	7	101	MEC	UB
56	HCR	13	11	7	77	MEC	UB
57	HPR*	11	10	1	10	MEC	HP
58	HPR*	4	4	1	4	MEC	HP
59	HPR*	9	8	1	8	MEC	HP
60	HCR*	3	2	5	10	MEC	HP/GP/UB
61	HCR*	9	8	5	38	MEC	HP/GP/UB
62	HPR*	7	6	1	6	MEC	HP
63	HPR*	7	6	1	6	MEC	HP
64	HPR*	9	8	1	8	MEC	HP
67-A	HTH/HGR	39	39	20	780	SKY/LL	HP
67-B	HTH/HGR	23	23	20	460	SKY/LL	HP
HL-77	HCC	1	1	30	30	LL	GP
HL-78	HCC	1	1	30	30	LL	GP
Total			905		12,697		

HPR* - Post & Pole harvest HSH – Shelterwood (8-12 tpa) HCR – Seed tree (4-6 tpa) HTH –Thinning HCR* - House log harvest HGR – Small group harvest HCC – Helicopter landing	UB – Underburning HP – Hand pile GP- Grapple pile YT – Yard tops WF – Whip fall YUM – Yard unutilized material	HEL – Helicopter MEC – Mechanical Logging LL – Loader Logging SKY – Skyline Logging
New System Road Construction 2.97 miles System Road Reconstruction / Maintenance 23.84 miles System Road Decommissioning 11.02 miles		

2.6.2 BEST MANAGEMENT PRACTICES, MANAGEMENT REQUIREMENTS AND MITIGATING MEASURES

The following best management practices, management requirements, and mitigating measures will be implemented in order to meet the Standards and Guidelines in the Umpqua National Forest Land and Resource Management Plan, as amended. In most cases, they have been designed to reduce or eliminate potential environmental effects. General Water Quality Best Management Practices (USDA-FS 1988) are prescribed to protect beneficial uses and meet water quality objectives. A cross reference to the Pacific Northwest Regional Guide is included with each best management practice (BMP). The BMPs are rated by their ability to implement and their effectiveness as defined by the 1988 Pacific Northwest Regional BMP Guide. The interdisciplinary team determined ratings. The possible ratings are as follows:

ABILITY TO IMPLEMENT

- High - Almost certain the BMP can be implemented.
- Moderate - Greater than 75% certainty the BMP can be implemented as planned.
- Low - Less than 75% certainty the BMP can be implemented as planned.

EFFECTIVENESS

- High - BMP is highly effective (>90%) based on one or more of the following types of documentation:
 - a) Literature/Research applicable to area.
 - b) Administrative Studies applicable to area.
 - c) Experience - judgment of an expert by education and/or experience.
 - d) Fact - obvious by reasoned (logical) response.
- Moderate - Documentation shows that the BMP is effective less than 90% of the time but at least 75% of the time or logic indicates that the BMP is highly effective but there is little or no documentation to back it up.

- Low - Effectiveness unknown or unverified and there is little or no documentation or applied logic is uncertain in this case or the BMP is estimated to be less than 75% effective.

LOGGING SYSTEMS AND TIMBER SALE REQUIREMENTS

- BMP (T-5, R-3) – Normal operating season will be from June 1 through October 31. Operations outside the normal operating season are permitted only when they can be conducted without resource damage. Contract provisions: AT17, BT6.31, BT6.65, BT8.21, BT9.3

Ability to Implement: High

Effectiveness: High (c, d)

- BMP (T-17, 21, 22; VM-2) – The following contract provisions will be required: Meadow Protection BT6.61, Sanitation and Servicing BT6.34, Contract Modification BT8.3

Ability to Implement: High

Effectiveness: High (d)

- BMP (T-4) - The following features will be designated on the Sale Area Map: all stream courses to be protected, unit boundaries, specified system roads, restricted haul routes, improvements, yarding methods, rock sources.

Ability to Implement: High

Effectiveness: High (d)

- Cultural resources will be protected if found during logging or road construction. Contract Provision: CT6.24#

- Prior to all operations and prior to unit boundary changes, the sale administrator and engineering representative will confer with the Heritage Program Manager. Any unit boundary changes made by the sale administrator due to logging feasibility will be tracked through GIS.

- The helicopter pads associated with the permanent helicopter landings located on proposed system roads 6000-937 and 6000-921 will be rocked. The rest of the area associated with the landings will be seeded with native grass or brush species to prevent establishment of trees and also serve as erosion control.

- BMP (T-9, 11; VM-1) - A tracked loader machine with at least a 35 foot boom will be used for yarding operations in order to minimize soil displacement and compaction in units 11, and 12 and portions of units 6, 10, 13, 25, and 67 A & B. Equipment will be restricted to designated loader paths and temporary haul roads approved by the sale administrator. Designated loader paths should be spaced an average of 100 feet apart. Designated temporary haul roads should be located at least 400 feet apart. The tracks on the loader will operate in a straight line, thus reducing soil displacement. Directional felling will be required into designated loader paths. Contract Provision; CT6.42#, CT6.4

Ability to Implement: High

Effectiveness: Moderate

- Protection of genetic trees and other reserve trees will be required. Contract provision: CT2.301#

- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment and reforestation.
- BMP (T-9, 11; VM-1) – A mechanized logging system will be used for felling and yarding operations in units 28, 29, 31, 35, 42 through 64. Equipment causing detrimental soil impacts will be restricted to designated paths spaced an average of 100 feet apart. Contract Provision CT6.42#, CT6.4
- To avoid noxious weed introduction, heavy equipment will be cleaned prior to entering the sale area. Contract Provision: CT6.343 (Option 2)
- BMP (T-12) - One end suspension and 75 foot lateral yarding will be required on skyline yarded units 38 and 39 and portions of units 6, 10, 13, 25, 29 and 67A & B to limit soil displacement. Contract Provision; CT6.42#

Ability to Implement: High

Effectiveness: High (c)

- To avoid damage to leave trees due to bark slippage, operations will be restricted to July 15 through October 31 in units 1, 4, 6, 10, 11, 13, 25, 28, 29, 31, 35, 38, 39, and 67A & B. Contract Provision; CT6.315#

RECREATION

- No commercial vehicles over 20,000 lbs will be allowed on the 2612 road from the junction of the 2610 to the 2614 roads and the 2614 road starting at the junction with the 2610 to the 2612 roads. This will reduce the conflict with recreation use.
- Recreation and forest users will be notified of all activities associated with logging operations through signing. The signs will be placed throughout the project area.
- Helicopters will be restricted from flying over the North Umpqua trail in Units 1 & 4. Helicopter landings are located in areas where flight paths will avoid the trail.

TRANSPORTATION SYSTEM

- BMP (T-15,16;R-18,23;W-8) - Temporary roads in units 6, 10 through 13, 25, 28, 29, 31, 35, 42 through 56, and 67A & B will be obliterated following logging use. They will be sub-soiled to 20 inches with an excavator to prepare a seedbed and allow for water drainage.

Ability to Implement: Moderate

Effectiveness: Moderate

- BMP (T-15,16;R-18,23;W-8) - Temporary roads in units 6, 10 through 13, 25, 28, 29, 31, 35, 42 through 56, and 67A & B will be obliterated following logging use. They will be sub-soiled to 20 inches with an excavator to prepare a seedbed and allow for water drainage.

- Temporary roads constructed in units 28, 29 and 31 will be left open to maintain short-term access to portions of the unit for post-sale treatments but will be obliterated when this work is complete. Contract Provision; CT6.621
- Excavated material will be pulled back and stabilized as close to the ground profile as possible. Slash depths will not exceed 6 inches. Stumps and slash will be placed back over 80% of the road surface for erosion control purposes. Contract Provisions: CT5.1# (Option 1)

Ability to Implement: High

Effectiveness: High (b, c, d)

- Road use restrictions will conform to Umpqua National Forest direction.
- Road specifications and maintenance levels for construction and reconstruction will be prescribed in the road management objectives.
- BMP (R-18;W-8) – Roads 2610-345, 347, 350, 634; 2614-454, 455, 456; 4792-200; 6000-920, 921, 934, 940, 950, 972 and 973 will be closed with rocks, earth berms, or gates following logging use in order to reduce erosion and the need for road maintenance. CT5.43

Ability to Implement: High

Effectiveness: High (d)

- BMP (R-2,4,5,8,9) – Erosion control will be required during construction of temporary roads in units 6, 10 through 13, 25, 28, 29, 31, 35, 42 through 56, and 67A & B; and system roads 2610-347; 4790-201; 6000- 921, 937, 951, 952, and 960. Erosion control will also be required during the reconstruction / maintenance of system roads 2610-100, 345, 346, 347, 350; 2614-430, 445, 454, 455, 456; 4792-000, 200; 6000, 920, 934, 940, 950, 960, 970, 971, 972 and 973. Specific measures include timing of construction, berms, and slope drains and insuring drainage structures are in place before each rainy season. Grass seeding will not be required on roads located above 4500 feet in elevation. Contract Provision: BT6.6, CT6.6#, and Standard and Special Specifications for Construction are required.

Ability to Implement: Moderate

Effectiveness: Moderate

- BMP (R-1) – The location, design, and construction of temporary roads in units 6, 10 through 13, 25, 28, 29, 31, 35, 42 through 56, and 67A & B; and system roads 2610-347; 4790-201; 6000-921, 937, 951, 952, and 960 will be accomplished with minimal resource damage. Contract Provision: CT5.1# (Option 1)

Ability to Implement: high

Effectiveness: High (c)

- BMP (R-20) – Traffic will be controlled during wet weather to prevent erosion and damage to roads. Contract Provision: CT5.12#
- BMP – KV funds will be collected to decommission system roads 2610-100, 345, 346; 2614-450, 460, 470; 6000-745, 750, 753, 754 and 932.

SOILS

- BMP (T-6) - Lands identified as technically unsuitable for timber production will be entered in GIS.

Ability to Implement: High

Effectiveness: High (d)

- The combined total areas of detrimentally compacted, displaced, puddled, and severely burned soil within an activity area will not exceed 20 percent. All roads and landings, unless rehabilitated to acceptable conditions, are considered to be in detrimental condition and are included as part of this 20 percent. Post-operations monitoring will be required and additional rehabilitation will be performed when this standard has not been met. The KV plan for this sale will be amended to fund such work.
- BMP (T-10) - Old landings, skid trails, and temporary roads will be re-used where deemed practical by the timber sale administrator. This will reduce the cumulative amount of detrimentally compacted soil within the activity area.

Ability to Implement: High

Effectiveness: Moderate

- At least 250 linear feet of logs per acre will be left in harvest units 12, 42-56, 60 and 61 for coarse woody debris recruitment. 120 linear feet will be made up of down logs greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 1 and 2. This standard will be met by marking two green trees (live culls if available) per acre for leave and then felling the tree after slash treatment. These trees can be dispersed throughout the harvest area or clumped. KV funds will be collected to fell these trees within proposed harvest units. The District wildlife biologist will determine the number and location of trees to be felled. The remaining 130 linear feet will be made up of either down logs in decay class 3, snags, or live green culls greater than or equal to 20 inches in diameter (small end) and 10 feet long in decay classes 1 through 6; or standing green trees of average stand diameter if the previously mentioned material is not available.
- Existing coarse woody debris already on the ground before harvest will be retained and protected to the greatest extent possible in all proposed harvest units. Existing coarse woody debris greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 3 and 4 will be marked for leave by the presale crew in leave tree marked units. Contract Provision: CT2.35#
- BMP (F-1, 2, 3) - To meet acceptable levels of surface soil loss resulting from gravity, water, or wind on timber harvest units, no less than 65% effective ground cover in units with <30 percent slope and no less than 85% effective ground cover in units with >30 percent slope must exist within the first year following ground disturbing activities for all proposed units. Low intensity burns and slash piling specifications will be implemented in order to meet effective ground cover standard. Contract Provision: CT6.74 (Option 1)

Ability to Implement: High

Effectiveness: High (back)

- BMP (T-10,11,13,14,15,16,18,19;R-2,3,5,6,7,8,9,20;VM-3,4) - The following contract provisions dealing with soil erosion will be required: Erosion Prevention and Control BT6.6, Temporary Roads BT6.62, Landings BT6.63, Skid Trails and Fire lines BT6.64, Current Operating Areas BT6.65, Erosion Control Structure Maintenance BT6.66

Ability to Implement: High

Effectiveness: High (c)

- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator.

WATERSHED

- BMP (T-7,8) – Stream course protection BT6.5 and Special Felling Objectives CT6.41 will be required for units 1, 4, 6, 10, 25, 31, 50, 51, 54, 55 and 67A & B in order to protect stream bank stability, riparian trees, and riparian vegetation.

Ability to implement: High

Effectiveness: high (c)

- BMP (T-7) – Riparian reserve widths, as described in the Riparian Area Summary located in Appendix D, will be required for Class III and IV streams adjacent to units 1, 4, 6, 10, 25, 31, 50, 51, 54, 55 and 67A & B. Riparian reserves widths will be based on the measurement of two old growth site potential trees within the riparian reserve. Riparian reserves are required in order to maintain stream bank stability, effective shade, and standing trees for future large woody material recruitment.

Ability to implement: High

Effectiveness: high (a, c, d)

- BMP (W-4) – Oil and Hazardous substance spill prevention and Countermeasures Plan (SPCC) will be required. Contract Provision: CT6.341

Ability to implement: High

Effectiveness: high (c)

- BMP (F-2, 3, 4, 5) – Riparian reserves adjacent to 1, 4, 6, 10, 25, 31, 50, 51, 54, 55 and 67A & B will be protected from prescribed fire.

Ability to implement: High

Effectiveness: high (a, c, d)

WILDLIFE AND BOTANY

- KV funds will be collected to control or eradicate noxious weed populations within sale areas.
- KV funds will be collected to manage for the potential of future noxious weed populations within sale areas.
- KV funds will be collected to re-vegetate disturbed areas within sale areas.

- KV funds will be collected to construct wildlife road closures within sale areas.
- KV funds will be collected to do forage enhancement within sale areas.
- KV funds will be collected to do riparian restoration within sale areas.
- KV funds will be collected to do natural opening maintenance within sale areas.
- KV funds will be collected to install water guzzlers within sale areas.
- KV funds will be collected to create denning habitat within sale areas.
- All existing snags greater than 15" DBH will be left in harvested areas, unless deemed a safety hazard by the sale administrator. Existing snags will be marked for leave by the presale crew within all leave tree marked harvest units. KV funds will be collected to create snags within sale areas through either topping or inoculation treatment. All other harvest units will retain the standard 3 green trees per acre. These green trees are being left for snag recruitment through natural mortality over the next three decades. As a minimum, snags will be retained within the proposed units at levels sufficient to support species of cavity nesting birds at 60 percent of potential population levels based on published guidelines and models. The Westside version of the Snag Recruitment Simulator has calculated this level to be 2.13 hard snags per acre and 0.15 soft snags per acre greater than 15 inches in diameter for the species living in forested habitats around the Lemolo Watershed Projects Analysis area.
- Scattered remnant old growth trees within commercial thinning harvest units 1, 4, 6, 10, 11, 13, 25, 28, 29, 31, 35, 38, 39 and 67A & B will be retained for structural diversity, future snag recruitment, and future large woody material recruitment; and to protect the small diameter thinning stand from logging damage.
- District wildlife biologists will assist the presale crew in the location and marking of leave groups and snag recruitment trees.
- At least fifteen percent of the area associated with units 42 – 56, 60 and 61 will be retained in groups .5 acres or more in size. Ten and a half percent of the area associated with units 12, 57 – 59, 62 – 64, will be retained in groups .5 acres to 2.5 acres or more in size. The remaining four percent will be retained as dispersed trees. Larger groups 2.5 acres or greater in size are preferable. To the extent possible, groups and dispersed retention should include the largest, oldest live trees, decadent or leaning trees, and hard snags occurring in the unit. The boundary of leave groups will be designated with aluminum flashers stating that the area is a leave group. Leave groups will be tracked through GIS.
- A seasonal restriction will be applied to units 1, 4, 6, 10, 11, 12, 13, 25, 28, 29, 31, 51, 58, 59 and 67 A&B based on consultation with the U.S. Fish and Wildlife Service on the northern spotted owl and bald eagle. Harvest restrictions between March 1 and July 15 will be required for units 1, 4, 6, 10-12, 28, 29, 35, 38, 39, 53, 57, 59, 63, and 64 to prevent disturbance take, unless spotted owl nesting is not confirmed during the planned harvest year. Nesting confirmation will involve 3 complete visits to the core area, April 1 – June 1, during the planned harvest year. CT6.25#

- Harvest restrictions between January 1 and August 31 will be required for units 1, 4 and 6 to prevent disturbance to bald eagle nesting, unless nesting is not confirmed during the planned harvest year. Inventory requirements may be changed based on requirements from USFWS. CT6.25#
- A 100 foot radius buffer zone is required around each *Cladonia norvegica* and *Ramaria rubrievanescens* (Survey and Manage fungi) location within units 11 and 25.
- A 100 foot radius buffer zone is required around each *Buxbaumia aphylla* location within units 28.
- Extreme care should be taken on the south end of unit 75 to make sure that burn piles stay in control and that fire does not inundate the adjacent riparian area and adversely affect a known population of *Tritomaria exsectiformis* (Survey and Manage bryophyte).
- The western most portion of unit 74 will be dropped in order to protect a very rare unique form of *Peltigera hydrothyria* (Green Photomorph). This involves leaving a 300 foot buffer boundary on the adjacent riparian area. Extreme care should be taken to make sure underburning stays in control and does not enter the 300 foot buffer.
- Leave groups will be located around populations of *Asarum wagneri* within units 50, 53, 63 and 64 in such a way that they cover the greatest densities of populations.
- Biological evaluations have been conducted for threatened, endangered, and sensitive species. Threatened, endangered, and sensitive species will be protected if found during timber sale operations. Contract Provision: CT6.25#

FIRE MANAGEMENT

- Logging slash will be disposed of to meet Umpqua National Forest fire hazard guidelines on all proposed units, if the post harvest fuels survey determines it is necessary for fuels hazard reduction. Specifics may be found in Appendix E.
- If loader piling or hand piling is designated for the unit, piles will be located on temporary haul roads or designated loader roads where possible. A small loader weighing less than 45,000 lbs. with at least a 25 foot reach will be required for all loader slash piling. All logs or log chunks left after harvest that are greater than or equal to 6 inches in diameter (small end) will be excluded from slash piles and scattered evenly throughout harvested areas.
- KV funds will be collected to accomplish prescribed fire objectives in units 69, 70, 71 and 76 and other funds will be used to accomplish prescribed fire objectives in units 14, 24, 73A, 73B, 74 and 75.
- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment in harvested areas.
- All non merchantable white fir will be whip felled in unit 12.
- Small diameter (8-12 inch DBH) down lodge pole and white pine will be YUM yarded and decked for public firewood cutting in unit 28.

- Yarding of tops will be required in unit 1 to reduce fuel loading.
- Underburning within units 14, 24, 69, 70, 71, and 74 will occur when conditions are such that dominant and codominant trees will survive the burn. Hand piling and burning within unit 73A, 73B, 75 and 76 will occur when conditions are such that dominant and codominant trees will survive the burn.
- Underburning in unit 69 will exclude Lake Creek riparian area, creating a mid –slope unit boundary.
- Unit 70 has an unnamed class III and IV stream on the east side of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- Unit 71 has an unnamed class IV stream on the west side and one in the middle of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- Hand piling and burning will occur within the class IV riparian area for unit 73B.
- The class IV riparian area on the west side of unit 74 will be buffered with a buffer at least 300 feet.
- A class IV riparian reserve exists inside unit 75 and will receive hand pile, swamper and jackpot burning. Fire activity within the riparian reserve will not consume large woody debris, kill riparian vegetation providing shade, and not consume the duff layer.
- All burning will comply with federal, state, and local air quality regulations.

SILVICULTURAL ACTIVITIES – POST HARVEST

- KV funds will be collected to pre-commercial thin overstocked existing plantations and natural stands within the sale area.
- Reforestation methods, which include planting and natural regeneration, will be used to establish trees on harvested areas within five years. Species will be those that are common to the area. Site specific information may be found in the prescription located in Appendix I. Mycorrhizal root dip jell will be used on all planted seedlings.
- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted harvest units, skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator. The return of organic material to treated areas will be subject to material availability or prescribed amendments.
- KV funds will be collected to prune 5 needle pine species for blister rust control within the sale areas.

- KV funds will be collected to perform animal damage control in 12, 42-56, 60 and 61.

2.7 ALTERNATIVE 5

The IDT developed this alternative to address some public's concern about timber harvest of old growth stands and stands with high recreational value within the project analysis area, while still trying to meet Purpose and Need. Compromise on these two public issues was emphasized in the development of this alternative. Compromise of the recreational value issue was met by dropping the most controversial units in this alternative. Compromise of the old growth issue was met by dropping the highest quality old growth stands within this alternative. Harvest units 2, 5, 9, 14, 15, 18-24, 26, 27, 30, 32, 34, 36, 37, 48, 53-56 and associated road construction were dropped from the Proposed Action to formulate this alternative. This alternative fully meets the Purpose and Need because it proposes needed activities across the Lemolo Watershed, including the Bunker Hill area.

2.7.1 ACTIVITIES UNDER ALTERNATIVE 5

TIMBER HARVEST ROAD WORK

Timber sales will harvest 245 acres using shelterwood and seed tree silvicultural prescriptions, commercially thin 835 acres, harvest 99 acres through small group selection, selectively harvest 42 acres for posts and poles, and harvest 10 acres for house logs using seed tree silvicultural prescriptions. These sales will supply timber to local and regional economies on a cost efficient, sustainable basis and help meet the probable sale quantity for the Umpqua National forest in 2004 and 2005. Timber harvest would produce approximately 20.55 million board feet. All timber harvest activities would meet current standards and guidelines for matrix lands. Artificial reforestation and/or natural regeneration will be used to establish new stands. More detail on silvicultural prescriptions can be found in the Silvicultural Prescription in Appendix I. Five sales are planned to be sold in 2004 and 2005 and operate for 2-3 years. Logging systems will be a combination of skyline, helicopter, loader, and mechanical. Construction of two permanent helicopter landings will occur. No timber harvest will occur within inventoried road less areas, riparian reserves, unsuitable soils, the OCRA, cultural sites, or owl cores.

Approximately 2.95 miles of new system road construction, 37.95 miles of road reconstruction/maintenance, 1.59 miles of road decommissioning inside potential sale area boundaries, 9.43 miles of road decommissioning outside potential sale area boundaries, 3.0 miles of temporary road construction and subsequent obliteration, and 2 acres of helicopter landing construction will occur under this alternative.

FUEL TREATMENT/FIRE HAZARD REDUCTION

Natural fuels and harvest activity fuels will be treated on 1,536 acres (303 acres of natural fuels) within the Lemolo watershed through underburning and pile burning. Fuel levels will be reduced to less than 21 tons/acre over the 1,536 acres. This will begin to move the Lemolo watershed from a high severity fire regime towards the historical moderate severity fire regime.

PINE HEALTH AND STAND DENSITY MANAGEMENT

Pine health will be promoted on 1360 acres within the Lemolo watershed through silvicultural prescriptions that reduce stand densities around individual pine; regenerate harvested areas with blister rust resistant white pine and sugar pine, and ponderosa pine; and harvest greater than 80

year old lodge pole pine stands that are highly susceptible to a mountain pine beetle outbreak. Stand health and vigor will be improved on 835 acres of mixed conifer stands within the Lemolo watershed through commercial thinning prescriptions that reduce existing stand densities.

SITE PRODUCTIVITY

Site productivity will be improved on 264 acres of plantations within the Lemolo watershed through subsoiling of old temporary roads, landings, and skid trails. KV funding will finance 21 acres of the 243 acres planned.

RECREATIONAL VALUE AND OLD GROWTH

Recreational value will be reduced for some concerned publics, through timber harvest on 595 acres surrounding the Lemolo Lake Recreation Area. One hundred and thirty one acres of growth habitat will be harvested and converted to early successional habitat and permanent openings in the form of roads and helicopter landings.

Figure 4 – Alternative Five Map

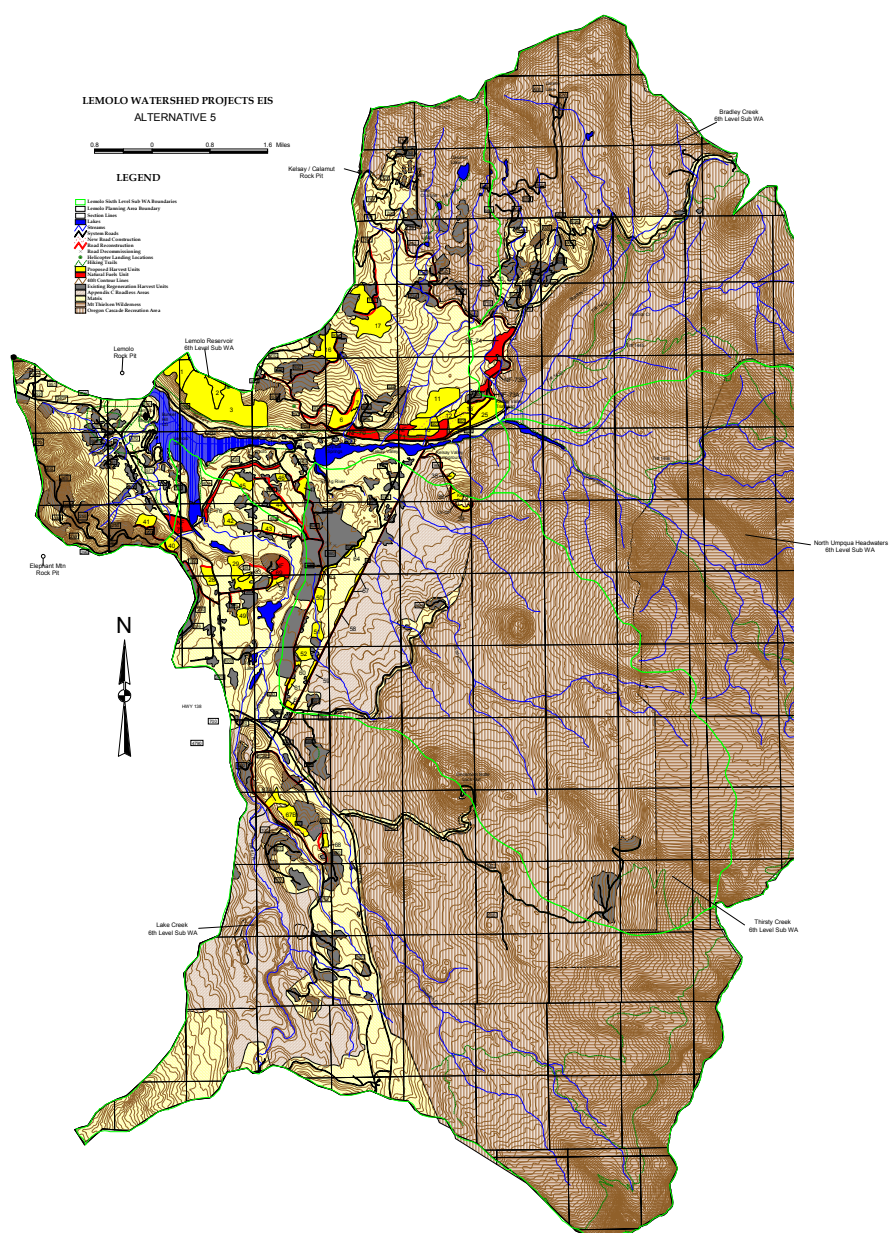


Table 4 – Alternative Five Unit Summary

UNIT #	SILV. RX	GROSS ACRES	NET ACRES	CUT VOLUME (mbf/ac)	UNIT VOL. (mbf)	LOGGING METHOD	FUELS TREATMENT
1	HTH	62	62	25	1550	HEL	HP/YT
3	HTH/HGR	297	297	15	4455	HEL	HP
4	HTH	40	40	20	800	HEL	HP
6	HTH/HGR	49	49	20	980	SKY/LL	UB
7	HSH/HTH	18	16	40	641	SKY	UB/WF/SP
10	HTH/HGR	58	58	20	1160	SKY/LL	UB
11	HTH/HGR	82	82	15	1230	LL	HP/GP
12	HSH	16	14	40	544	LL	GP/WF
13	HTH/HGR	36	36	20	720	SKY/LL	HP
16	HGR	57	11	25	285	LL	GP
17	HGR	146	29	20	584	LL	GP
25	HTH/HGR	93	93	10	930	SKY/LL	HP
28	HTH	21	21	10	210	MEC	HP/YUM(LPP)
29	HTH/HGR	57	57	15	855	SKY/MEC	HP
31	HTH	14	14	15	210	MEC	HP
33	HSH	8	7	25	178	LL	UB
35	HTH	5	5	10	50	MEC	HP
38	HTH	12	12	20	240	SKY	UB
39	HTH	6	6	25	150	SKY	UB
40	HSH	22	19	45	842	SKY	UB
41	HSH	26	22	45	995	SKY	UB
42	HCR	14	12	7	83	MEC	UB
43	HCR	13	11	7	77	MEC	UB
44	HCR	18	15	7	107	MEC	UB
45	HCR	29	25	7	173	MEC	UB
46	HCR	9	8	7	54	MEC	UB
47	HCR	15	13	7	89	MEC	UB
49	HCR	19	16	7	113	MEC	UB
50	HCR	25	21	7	149	MEC	UB
51	HCR	20	17	7	119	MEC	UB
52	HCR	23	20	7	137	MEC	UB
57	HPR*	11	10	1	10	MEC	HP
58	HPR*	4	4	1	4	MEC	HP
59	HPR*	9	8	1	8	MEC	HP
60	HCR*	3	2	5	10	MEC	HP/GP/UB
61	HCR*	9	8	5	38	MEC	HP/GP/UB
62	HPR*	7	6	1	6	MEC	HP
63	HPR*	7	6	1	6	MEC	HP
64	HPR*	9	8	1	8	MEC	HP
67-A	HTH/HGR	39	39	20	780	SKY/LL	HP
67-B	HTH/HGR	23	23	20	460	SKY/LL	HP
68	HSH/HTH	10	9	50	450	SKY	UB/SP/WF

UNIT #	SILV. RX	GROSS ACRES	NET ACRES	CUT VOLUME (mbf/ac)	UNIT VOL. (mbf)	LOGGING METHOD	FUELS TREATMENT
HL-77	HCC	1	1	30	30	LL	GP
HL-78	HCC	1	1	30	30	LL	GP
Total			1233		20550		
<div style="display: flex; justify-content: space-between;"> <div> HPR* - Post & Pole harvest HSH – Shelterwood (8-12 tpa) HCR – Seed tree (4-6 tpa) HTH –Thinning HCR* - House log harvest HGR – Small group harvest HPR – Partial harvest HCC – Helicopter landing </div> <div> UB – Underburning SP – Slash pull back HP – Hand pile GP- Grapple pile YT – Yard tops WF – Whip fall YUM – Yard unutilized material </div> <div> HEL – Helicopter MEC – Mechanical Logging LL – Loader Logging SKY – Skyline Logging </div> </div>							
New System Road Construction 3.17 miles System Road Reconstruction / Maintenance 51.79 miles System Road Decommissioning 11.02 miles							

2.7.2 BEST MANAGEMENT PRACTICES, MANAGEMENT REQUIREMENTS AND MITIGATING MEASURES

The following best management practices, management requirements, and mitigating measures will be implemented in order to meet the Standards and Guidelines in the Umpqua National Forest Land and Resource Management Plan, as amended. In most cases, they have been designed to reduce or eliminate potential environmental effects. General Water Quality Best Management Practices (USDA-FS 1988) are prescribed to protect beneficial uses and meet water quality objectives. A cross reference to the Pacific Northwest Regional Guide is included with each best management practice (BMP). The BMPs are rated by their ability to implement and their effectiveness as defined by the 1988 Pacific Northwest Regional BMP Guide. The interdisciplinary team determined ratings. The possible ratings are as follows:

ABILITY TO IMPLEMENT

- High - Almost certain the BMP can be implemented.
- Moderate - Greater than 75% certainty the BMP can be implemented as planned.
- Low - Less than 75% certainty the BMP can be implemented as planned.

EFFECTIVENESS

- High - BMP is highly effective (>90%) based on one or more of the following types of documentation:

- a) Literature/Research applicable to area.

- b) Administrative Studies applicable to area.
 - c) Experience - judgment of an expert by education and/or experience.
 - d) Fact - obvious by reasoned (logical) response.
- Moderate - Documentation shows that the BMP is effective less than 90% of the time but at least 75% of the time or logic indicates that the BMP is highly effective but there is little or no documentation to back it up.
 - Low - Effectiveness unknown or unverified and there is little or no documentation or applied logic is uncertain in this case or the BMP is estimated to be less than 75% effective.

LOGGING SYSTEMS AND TIMBER SALE REQUIREMENTS

- BMP (T-5, R-3) – Normal operating season will be from June 1 through October 31. Operations outside the normal operating season are permitted only when they can be conducted without resource damage. Contract provisions: AT17, BT6.31, BT6.65, BT8.21, BT9.3

Ability to Implement: High

Effectiveness: High (c, d)

- BMP (T-17, 21, 22; VM-2) – The following contract provisions will be required: Meadow Protection BT6.61, Sanitation and Servicing BT6.34, Contract Modification BT8.3

Ability to Implement: High

Effectiveness: High (d)

- BMP (T-4) - The following features will be designated on the Sale Area Map: all stream courses to be protected, unit boundaries, specified system roads, restricted haul routes, improvements, yarding methods, rock sources.

Ability to Implement: High

Effectiveness: High (d)

- Cultural resources will be protected if found during logging or road construction. Contract Provision: CT6.24#
- Prior to all operations and prior to unit boundary changes, the sale administrator and engineering representative will confer with the Heritage Program Manager. Any unit boundary changes made by the sale administrator due to logging feasibility will be tracked through GIS.
- The helicopter pads associated with the permanent helicopter landings located on proposed system roads 6000-937 and 6000-921 will be rocked. The rest of the area associated with the landings will be seeded with native grass or brush species to prevent establishment of trees and also serve as erosion control.
- BMP (T-9, 11; VM-1) - A tracked loader machine with at least a 35 foot boom will be used for yarding operations in order to minimize soil displacement and compaction in units 11, 12, 16, 17 & 33 and portions of units 6, 10, 13, 25, and 67A & B. Equipment will be restricted to designated loader paths and temporary haul roads approved by the sale administrator. Designated loader paths should be spaced an average of 100 feet apart.

Designated temporary haul roads should be located at least 400 feet apart. The tracks on the loader will operate in a straight line, thus reducing soil displacement. Directional felling will be required into designated loader paths. Contract Provision; CT6.42#, CT6.4

Ability to Implement: High

Effectiveness: Moderate

- Protection of genetic trees and other reserve trees will be required. Contract provision: CT2.301#
- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment and reforestation.
- BMP (T-9, 11; VM-1) – A mechanized logging system will be used for felling and yarding operations in units 28, 29, 31, 35, 42-47 and 49-64. Equipment causing detrimental soil impacts will be restricted to designated paths spaced an average of 100 feet apart. Contract Provision CT6.42#, CT6.4
- To avoid noxious weed introduction, heavy equipment will be cleaned prior to entering the sale area. Contract Provision: CT6.343 (Option 2)
- BMP (T-12) - One end suspension and 75 foot lateral yarding will be required on skyline yarded units 7, 38, 39, 40 and 41 and portions of units 6, 10, 13, 25, 29 and 67A & B to limit soil displacement. Contract Provision; CT6.42#

Ability to Implement: High

Effectiveness: High (c)

- To avoid damage to leave trees due to bark slippage, operations will be restricted to July 15 through October 31 in units 1, 3, 4, 6, 7, 10, 11, 13, 25, 28, 29, 31, 35, 38, 39, 67A & B and 68. Contract Provision; CT6.315#

RECREATION

- Unit 3 will require a 200 foot no cut buffer along the North Umpqua Trail.
- No commercial vehicles over 20,000 lbs will be allowed on the 2612 road from the junction of the 2610 to the 2614 roads and the 2614 road starting at the junction with the 2610 to the 2612 roads. This will reduce the conflict with recreation use.
- Recreation and forest users will be notified of all activities associated with logging operations through signing. The signs will be placed throughout the project area.
- Helicopters will be restricted from flying over the North Umpqua trail in Units 1, 3 and 4. Helicopter landings are located in areas where flight paths will avoid the trail.

TRANSPORTATION SYSTEM

- BMP (T-15,16;R-18,23;W-8) - Temporary roads in units 6, 10 through 13, 16, 17, 25, 33, 35, 42-47, 49-52, and 67A & B will be obliterated following logging use. They will be sub-soiled to 20 inches with an excavator to prepare a seedbed and allow for water drainage.

Ability to Implement: Moderate

Effectiveness: Moderate

- BMP (T-15,16;R-18,23;W-8) - Temporary roads in units 6, 10 through 13, 16, 17, 25, 33, 35, 42-47, 49-52, and 67A & B will be obliterated following logging use. They will be sub-soiled to 20 inches with an excavator to prepare a seedbed and allow for water drainage.
- Temporary roads constructed in units 28, 29 and 31 will be left open to maintain short-term access to portions of the unit for post-sale treatments but will be obliterated when this work is complete. Contract Provision; CT6.621
- Excavated material will be pulled back and stabilized as close to the ground profile as possible. Slash depths will not exceed 6 inches. Stumps and slash will be placed back over 80% of the road surface for erosion control purposes. Contract Provisions: CT5.1# (Option 1)

Ability to Implement: High

Effectiveness: High (b, c, d)

- Road use restrictions will conform to Umpqua National Forest direction.
- Road specifications and maintenance levels for construction and reconstruction will be prescribed in the road management objectives.
- BMP (R-18;W-8) – Roads 2610-222, 345, 347, 350, 634; 2614-454, 455, 456; 4792-200; 6000-742, 746, 920, 921, 930, 934, 936, 940, 950 will be closed with rocks, earth berms, or gates following logging use in order to reduce erosion and the need for road maintenance. CT5.43

Ability to Implement: High

Effectiveness: High (d)

- BMP (R-2,4,5,8,9) – Erosion control will be required during construction of temporary roads in units 6, 10 through 13, 16, 17, 25, 33, 35, 42-47, 49-52, and 67A & B; and system roads 2610-347; 4790-201; 6000- 921, 937, 951, 952, and 960. Erosion control will also be required during the reconstruction / maintenance of system roads 2610-200, 222, 345, 346, 347, 350; 2614-430, 454, 455, 456; 4700-700; 4792-000, 200; 6000-700, 742, 746, 920, 930, 934, 936, 940, 950 and 960. Specific measures include timing of construction, berms, and slope drains and insuring drainage structures are in place before each rainy season. Grass seeding will not be required on roads located above 4500 feet in elevation. Contract Provision: BT6.6, CT6.6#, and Standard and Special Specifications for Construction are required.

Ability to Implement: Moderate

Effectiveness: Moderate

- BMP (R-1) – The location, design, and construction of temporary roads in units 6, 10 through 13, 16, 17, 25, 33, 35, 42-47, 49-52, and 67A & B; and system roads 2610-347; 4790-201; 6000-921, 937, 951, 952, and 960 will be accomplished with minimal resource damage. Contract Provision: CT5.1# (Option 1)

Ability to Implement: high

Effectiveness: High (c)

- BMP (R-20) – Traffic will be controlled during wet weather to prevent erosion and damage to roads. Contract Provision: CT5.12#
- BMP – KV funds will be collected to decommission system roads 2610-100, 345; 2614-450, 460, 470; 6000-745, 750, 753, 754 and 932.

SOILS

- BMP (T-6) - Lands identified as technically unsuitable for timber production will be entered in GIS.

Ability to Implement: High

Effectiveness: High (d)

- The combined total areas of detrimentally compacted, displaced, puddled, and severely burned soil within an activity area will not exceed 20 percent. All roads and landings, unless rehabilitated to acceptable conditions, are considered to be in detrimental condition and are included as part of this 20 percent. Post-operations monitoring will be required and additional rehabilitation will be performed when this standard has not been met. The KV plan for this sale will be amended to fund such work.
- BMP (T-10) - Old landings, skid trails, and temporary roads will be re-used where deemed practical by the timber sale administrator. This will reduce the cumulative amount of detrimentally compacted soil within the activity area.

Ability to Implement: High

Effectiveness: Moderate

- At least 250 linear feet of logs per acre will be left in harvest units 7, 12, 33, 40-47, 49-56, 60, 61, and 68 for coarse woody debris recruitment. 120 linear feet will be made up of down logs greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 1 and 2. This standard will be met by marking two green trees (live culls if available) per acre for leave and then felling the tree after slash treatment. In addition, four large diameter (>20" DBH) mountain hemlock/acre will be felled and left within the groups in order to approximate the high down wood levels associated with laminated root disease pockets in the mountain hemlock zone. This includes units 16 and 17. These trees can be dispersed throughout the harvest area or clumped. KV funds will be collected to fell these trees within proposed harvest units. The District wildlife biologist will determine the number and location of trees to be felled. The remaining 130 linear feet will be made up of either down logs in decay class 3, snags, or live green culls greater than or equal to 20 inches in diameter (small end) and 10 feet long in decay classes 1 through 6; or standing green trees of average stand diameter if the previously mentioned material is not available.

- Existing coarse woody debris already on the ground before harvest will be retained and protected to the greatest extent possible in all proposed harvest units. Existing coarse woody debris greater than or equal to 20 inches in diameter (small end) and 16 feet long in decay classes 3 and 4 will be marked for leave by the presale crew in leave tree marked units. Contract Provision: CT2.35#
- BMP (F-1, 2, 3) - To meet acceptable levels of surface soil loss resulting from gravity, water, or wind on timber harvest units, no less than 65% effective ground cover in units with <30 percent slope and no less than 85% effective ground cover in units with >30 percent slope must exist within the first year following ground disturbing activities for all proposed units. Low intensity burns and slash piling specifications will be implemented in order to meet effective ground cover standard. Contract Provision: CT6.74 (Option 1)

Ability to Implement: High

Effectiveness: High (back)

- BMP (T-10,11,13,14,15,16,18,19;R-2,3,5,6,7,8,9,20;VM-3,4) - The following contract provisions dealing with soil erosion will be required: Erosion Prevention and Control BT6.6, Temporary Roads BT6.62, Landings BT6.63, Skid Trails and Fire lines BT6.64, Current Operating Areas BT6.65, Erosion Control Structure Maintenance BT6.66

Ability to Implement: High

Effectiveness: High (c)

- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator.

WATERSHED

- BMP (T-7,8) – Stream course protection BT6.5 and Special Felling Objectives CT6.41 will be required for units 1, 3, 4, 6, 7, 10, 11, 25, 31, 40, 50, 51 and 67A & B in order to protect stream bank stability, riparian trees, and riparian vegetation.

Ability to implement: High

Effectiveness: high (c)

- BMP (T-7) – Riparian reserve widths, as described in the Riparian Area Summary located in Appendix D, will be required for Class III and IV streams adjacent to units 1, 3, 4, 6, 7, 10, 11, 25, 31, 40, 50, 51 and 67A & B. Riparian reserves widths will be based on the measurement of two old growth site potential trees within the riparian reserve. Riparian reserves are required in order to maintain stream bank stability, effective shade, and standing trees for future large woody material recruitment.

Ability to implement: High

Effectiveness: high (a,c,d)

- BMP (W-4) – Oil and Hazardous substance spill prevention and Countermeasures Plan (SPCC) will be required. Contract Provision: CT6.341

Ability to implement: High

Effectiveness: high (c)

- BMP (F-2,3,4,5) – Riparian reserves adjacent to units 1, 3, 4, 6, 7, 10, 11, 25, 31, 40, 50, 51 and 67A & B will be protected from prescribed fire.

Ability to implement: High

Effectiveness: high (aced)

WILDLIFE AND BOTANY

- KV funds will be collected to control or eradicate noxious weed populations within sale areas.
- KV funds will be collected to manage for the potential of future noxious weed populations within sale areas.
- KV funds will be collected to re-vegetate disturbed areas within sale areas.
- KV funds will be collected to construct wildlife road closures within sale areas.
- KV funds will be collected to do forage enhancement within sale areas.
- KV funds will be collected to do riparian restoration within sale areas.
- KV funds will be collected to do natural opening maintenance within sale areas.
- KV funds will be collected to install water guzzlers within sale areas.
- KV funds will be collected to create denning habitat within sale areas.
- All existing snags greater than 15” DBH will be left in harvested areas, unless deemed a safety hazard by the sale administrator. Existing snags will be marked for leave by the presale crew within all leave tree marked harvest units. KV funds will be collected to create snags within sale areas through either topping or inoculation treatment. All other harvest units will retain the standard 3 green trees per acre. These green trees are being left for snag recruitment through natural mortality over the next three decades. As a minimum, snags will be retained within the proposed units at levels sufficient to support species of cavity nesting birds at 60 percent of potential population levels based on published guidelines and models. The Westside version of the Snag Recruitment Simulator has calculated this level to be 2.13 hard snags per acre and 0.15 soft snags per acre greater than 15 inches in diameter for the species living in forested habitats around the Lemolo Watershed Projects Analysis area.
- Scattered remnant old growth trees within commercial thinning harvest units 1, 3, 4, 6, 10, 11, 13, 25, 28, 29, 31, 35, 38, 39 and 67A & B will be retained for structural diversity, future snag recruitment, and future large woody material recruitment; and to protect the small diameter thinning stand from logging damage.
- District wildlife biologists will assist the presale crew in the location and marking of leave groups and snag recruitment trees.

- At least fifteen percent of the area associated with units 42-47, 49-52, 60 and 61 will be retained in groups .5 acres or more in size. Ten and a half percent of the area associated with units 7, 12, 16, 17, 33, 40, 41, 57-59, 62- 64, and 68 will be retained in groups 0.5 acres to 2.5 acres or more in size. The remaining four percent will be retained as dispersed trees. Larger groups 2.5 acres or greater in size are preferable. To the extent possible, groups and dispersed retention should include the largest, oldest live trees, decadent or leaning trees, and hard snags occurring in the unit. The boundary of leave groups will be designated with aluminum flashers stating that the area is a leave group. Leave groups will be tracked through GIS.
- A seasonal restriction will be applied to units 1, 3, 4, 6, 7, 10, 11, 12, 13, 16, 17, 25, 28, 29, 31, 33, 40, 51, 58, 59, and 67 A & B based on consultation with the U.S. Fish and Wildlife Service on the northern spotted owl and bald eagle. Harvest restrictions between March 1 and July 15 will be required for units 1, 3, 4, 6, 7, 10, 11, 12, 16, 17, 28 – 29, 35 – 41, 57, 59, and 63, 64 and 68 to prevent disturbance take, unless spotted owl nesting is not confirmed during the planned harvest year. Nesting confirmation will involve 3 complete visits to the core area, April 1 – June 1, during the planned harvest year.
- Harvest restrictions between January 1 and August 31 will be required for units 1, 3, 4 and 6 to prevent disturbance to bald eagle nesting, unless nesting is not confirmed during the planned harvest year. Inventory requirements may be changed based on requirements from USFWS. CT6.25#
- A 100 foot radius buffer zone is required around each *Cladonia norvegica* and *Ramaria rubrievanescens* (Survey and Manage fungi) location within units 11 and 25.
- A 100 foot radius buffer zone is required around each *Buxbaumia aphylla* location within units 28.
- Extreme care should be taken on the south end of unit 75 to make sure that burn piles stay in control and that fire does not inundate the adjacent riparian area and adversely affect a known population of *Tritomaria exsectiformis* (Survey and Manage bryophyte).
- The western most portion of unit 74 will be dropped in order to protect a very rare unique form of *Peltigera hydrothyria* (Green Photomorph). This involves leaving a 300 foot buffer boundary on the adjacent riparian area. Extreme care should be taken to make sure underburning stays in control and does not enter the 300 foot buffer.
- Leave groups will be located around populations of *Asarum wagneri* within units 50, 63 and 64 in such a way that they cover the greatest densities of populations.
- Biological evaluations have been conducted for threatened, endangered, and sensitive species. Threatened, endangered, and sensitive species will be protected if found during timber sale operations. Contract Provision: CT6.25#

FIRE MANAGEMENT

- Unit 71 has an unnamed class IV stream on the west side and one in the middle of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- Hand piling and burning will occur within the class IV riparian area for unit 73-B.
- The class IV riparian area on the west side of unit 74 will be buffered with a buffer at least 300 feet.
- A class IV riparian reserve exists inside unit 75 and will receive hand pile, swamper and jackpot burning. Fire activity within the riparian reserve will not consume large woody debris, kill riparian vegetation providing shade, and not consume the duff layer.
- Unit 70 has an unnamed class III and IV stream on the east side of the unit. Fire will be allowed to back into the riparian areas, if not consuming large woody debris, not killing riparian vegetation providing shade, and not consuming the duff layer.
- All burning will comply with federal, state, and local air quality regulations.
- Logging slash will be disposed of to meet Umpqua N.F. fire hazard fuel residue management guidelines on all proposed units, if the post harvest fuels survey determines it is necessary for fuels hazard reduction. Specifics may be found in Appendix E.
- If loader piling or hand piling is designated for the unit, piles will be located on temporary haul roads or designated loader roads where possible. A small loader weighing less than 45,000 lbs. with at least a 25 foot reach will be required for all loader slash piling. All logs or log chunks left after harvest that are greater than or equal to 6 inches in diameter (small end) will be excluded from slash piles and scattered evenly throughout harvested areas.
- KV funds will be collected to accomplish prescribed fire objectives in units 69, 70, 71, 73A, 73B, 74, 75, and 76.
- All damaged natural tree regeneration less than 7 inches in diameter will be felled and bucked to 12 foot lengths to facilitate slash treatment in harvested areas.
- Underburning within units 14, 24, 69, 70, 71, and 74 will occur when conditions are such that dominant and codominant trees will survive the burn. Hand piling and burning within unit 73A, 73 B, 75 and 76 will occur when conditions are such that dominant and codominant trees will survive the burn.
- Underburning in unit 69 will exclude Lake Creek riparian area, creating a mid-slope unit boundary.
- All non merchantable white fir will be whip felled in units 7 and 12. All non-merchantable white fir and western hemlock will be whip felled in unit 68.
- Yarding of tops will be required in unit 1 to reduce fuel loading.

- Slash pull back will be required around Douglas-fir between 14 – 22 inches DBH in units 7 and 68.
- Small diameter (8-12 inch DBH) down lodge pole and white pine will be YUM yarded and decked for public firewood cutting in units 28.

SILVICULTURAL ACTIVITIES – POST HARVEST

- KV funds will be collected to pre-commercial thin overstocked existing plantations and natural stands within the sale area.
- Reforestation methods, which include planting and natural regeneration, will be used to establish trees on harvested areas within five years. Species will be those that are common to the area. Site specific information may be found in the prescription located in Appendix I. Mycorrhizal root dip jell will be used on all planted seedlings.
- KV funds will be collected to improve site productivity in existing plantations within sale areas. Methods will include sub-soiling of compacted harvest units, skid roads and temporary haul roads, and bringing organic material back onto sub-soiled areas with an excavator. The return of organic material to treated areas will be subject to material availability or prescribed amendments.
- KV funds will be collected to prune 5 needle pine species for blister rust control within the sale areas.
- KV funds will be collected to perform animal damage control in 7, 12, 33, 40-47, 49-52, 60, 61, and 68.

Table 5 – Monitoring Plan

MONITORING ITEM	HOW IS IT MONITORED?	POSITION RESPONSIBLE	THRESHOLD OF VARIABILITY	ACTION NECESSARY
<p>Sale Preparation</p> <p>Unit Prescriptions</p> <p>Unit Acreage</p> <p>Compliance with LRMP, as amended.</p> <p>Best Management Practices (BMP), Management Requirements, and Mitigating Measures</p> <p>Cultural Resources, Survey and Manage species, and T & E Species</p>	<p>Compare presale field work to EA.</p> <p>Compare total traversed acres to EA estimate.</p> <p>LRMP compliance checklists</p> <p>Compare contract package to the EA and BMP checklist</p> <p>Found in unit or sale area during sale layout, marking, or cruising</p>	<p>Presale tech, sale planner, silviculturist</p> <p>Presale tech, sale planner</p> <p>Interdisciplinary team</p> <p>Presale tech, sale planner, resource specialists</p> <p>Presale tech, sale planner, resource specialists</p>	<p>Any unit prescription different from EA</p> <p>+/- 20% difference</p> <p>EA does not meet LRMP standards and guidelines</p> <p>Any deviation from EA or BMP checklist</p> <p>Any found in or adjacent to units with impacts expected</p>	<p>Remark, change unit boundary or prepare correction, supplement, or revision to EA</p> <p>Change unit boundary or prepare correction, supplement, or revision to EA</p> <p>Prescribe additional measures to insure compliance with standards and guidelines.</p> <p>Prepare correction, supplement, or revision to EA or contract</p> <p>Adjust unit boundary or prescription, delete unit, and identify other protection measures.</p>
<p>Sale Administration</p> <p>Best Management Practices (BMP), Management Requirements, and Mitigating Measures</p> <p>Cultural Resources, Survey and Manage species, and T & E Species</p>	<p>Compare implementation to contract package, BMP checklist, and EA</p> <p>Found in sale unit</p>	<p>Sale administrator, sale planner, resource specialist, road inspector</p> <p>Sale administrator, resource specialist</p>	<p>Does not meet LRMP standards and guidelines or EA objectives</p> <p>Any found in or adjacent to units with impacts expected</p>	<p>Prescribe additional measures to insure compliance with LRMP standards and guidelines or EA objectives</p> <p>Adjust unit boundary or prescription, delete unit, identify other protection measures, and monitor effects.</p>

MONITORING ITEM	HOW IS IT MONITORED?	POSITION RESPONSIBLE	THRESHOLD OF VARIABILITY	ACTION NECESSARY
Post Sale Best Management Practices (BMP), Management Requirements, and Mitigating Measures Items in the 1990 LRMP Monitoring Plan Applicable to the Project	Compare implementation to BMP checklist and EA See Chapter V of LRMP	Fuels forester/tech, engineering forester/tech, reforestation/tse forester/tech, silviculturist, resource specialists See Chapter V of LRMP	Does not meet LRMP or PFP standards and guidelines or EA objectives See Chapter V of LRMP	Prescribe additional measures to insure compliance with LRMP standards and guidelines or EA objectives See Chapter V of LRMP

Table 6 – Alternative Comparison Table

ISSUES & CONCERNS	OLD GROWTH	FIRE HAZARD		RECREATIONAL VALUES	PINE HEALTH		STAND DENSITY		KV ACTIVITIES	PSQ
ALTERNATIVE	1.) Acres Harvested (percent of old growth harvested within watershed)	Bunker Hill	Lemolo Watershed	1.) Acres harvested within areas identified as high recreational value through public comment	Bunker Hill	Lemolo Watershed	Bunker Hill	Lemolo Watershed	1.) Miles of road decom in analysis area / in KV 2.) Acres of subsoil in KV 2a) Acres of subsoil out KV 3.) Acres of prescribed fire	Total Harvest Volume MBF
		1.) Acres of FM-8 2.) Rate of spread (feet per minute) 3.) Flame length height (feet)	1.) Acres where MA reduce fuel level to < 21 tons /acres Prescribed natural fuels acres included in total		1.) Acres treated to promote pine health	1.) Acres treated to promote pine health	1.) Acres of HTH	1.) Acres of HTH		
1 (No action)	-0-(0%)	1) -0- 2) 8.1 3) 4.9	-0-	-0-	-0-	-0-	-0-	-0-	-0-	-0-
2 (Proposed Action)	300 (.4%)	1) 488 2) 2.2 3) 1.8	1,861	941	488	1,703	374	892	1) 11.02 / 3.9 2) 192.4 2a) 71.6 3) 282	27.7
3	2 (.008%)	1) -0- 2) 8.1 3) 4.9	939	-0-	-0-	763	-0-	374	1) 11.02 / .29 2) 21 2a) 243 3) 303	8.7
4	3 (.008%)	1) 102 2) 6.7 3) 4.0	1,208	267	102	1,032	102	553	1) 11.02 / 1.99 2) 25 2a) 239 3) 303	12.7
5	131 (.2%)	1) 399 2) 2.1 3) 2.1	1,536	595	399	1,360	384	835	1) 11.02 / 1.59 2) 21 2a) 243 3) 303	20.5
